MAN-004000-000
Rev. 1.2

CDI-4000

DSSI to SCSI Adapter User's Manual

eurologic

EUROLOGIC SYSTEMS LTD.
49 BRACKEN ROAD, SANDYFORD INDUSTRIAL ESTATE,
DUBLIN 18, IRELAND
Tel: + 353 - 1 - 2956366
Fax: + 353 - 1 - 2958433

Copyright

This manual is copyrighted and all rights are reserved. No portion of this document may be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine readable form without prior written consent from CMD Technology, Inc. (CMD).

CMD, CMD Technology, and CDI-4000 are all trademarks of CMD Technology, Inc. All other product and company names are trademarks and registered trademarks of other manufacturers.

Copyright © CMD Technology, Inc. June 1992. All rights reserved.

Disclaimer

CMD reserves the right to make changes to this manual and the equipment described herein without notice. CMD has made all reasonable efforts to insure that the information in this manual is accurate and complete. However, CMD shall not be liable for any technical or editorial errors or omissions made herein or for incidental, special, or consequential damage of whatsoever nature resulting from the furnishing of this manual, or operation and performance of equipment in connection with this manual.

FCC Notice

Class A Computing Device:
This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warranty

BASIC WARRANTY - In the absence of any optional warranty or continuing provisions by formal agreement, CMD warrants its products in accordance with the schedules listed below. Purchaser hereafter mentioned refers at all times to the customer who purchased CMD product(s).

HOST ADAPTER WARRANTY - CMD warrants Host Adapter products of its manufacture to be free from defect in material and workmanship for a period of one year from the date of shipment. During this period, if the customer experiences difficulties with a CMD Host Adapter and is unable to resolve the problem via phone with CMD Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of an RMA, the Purchaser is responsible for returning the product to CMD, freight prepaid. CMD, upon verification of warranty, will repair or replace at its option the Host Adapter in question, and will then return the product to the Purchaser, freight prepaid.

CABLE WARRANTY - All CMD provided cables are warranted for ninety (90) days from the time of shipment. Questionable cables should be returned to CMD, freight prepaid, where they will be repaired or replaced by CMD at its option and returned to the Purchaser, freight prepaid.

GENERAL TERMS - The above warranties shall not apply to expendable components such as fuses, bulbs, and the like, nor to connectors, adapters, and other items not a part of the basic product. CMD shall have no obligation to make repairs or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the product, or use of the product in such a manner for which it was not designed, or by causes external to the product, such as, but not limited to, power failure or air conditioning. CMD's sole obligation hereunder shall be to repair or replace any defective product, and, unless stated, pay return transportation costs within the United States of America for such replacement. Purchaser shall provide labor for removal of the defective product, shipping charges for return to CMD and installation of its replacement. On-site services are not a part of this warranty. Above warranties are subject to change without notice.

RETURNED MATERIAL - Warranty claims must be received by CMD within the applicable warranty period. A replaced product, or part thereof, shall become the property of CMD and shall be returned to CMD at Purchaser's expense. All returned material must be accompanied by a Return Materials Authorization (RMA) number assigned by CMD. For RMA numbers call CMD at (714) 454-0800.

THE EXPRESSED WARRANTIES SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ALL SUCH OTHER WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY CMD. THESE STANDARD EXPRESS WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF CMD FOR DAMAGES, INCLUDING BUT NOT LIMITED TO SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE PRODUCT.

Return and Repair Policy

WARRANTY PERIOD

The following warranty period is from the date of shipment:

CMD Host Adapter	one year
Cable	90 days
Drive	manufacturer's warranty

RETURN FOR CREDIT

The allowable period of return for credit from the date of shipment is as follows

CMD Host Adapter	less than 90 days
Cable	less than 60 days
Drive	not applicable

RETURN FOR REPAIR

CMD Host Adapter

In-Warranty (Less then 1 year)

- CMD offers a *15 working day turnaround repair service* at the cost of parts only. Defective boards will be repaired and returned to the customer within 15 working days from the date of return to CMD.
- CMD also offers two *in-warranty 24 hour expediting services:*

  24 Hour Turnaround Loaner Service:

  Under this policy, CMD will ship a loaner in 24 hours during regular working days to the customer for a charge of $100.00 per loaner. Upon receiving the loaner, customer must return the defective board to CMD within seven (7) days for repair. CMD will repair the defective board and return the board to the customer. Customer must then return the loaner in seven (7) days after the receipt of the repaired board. Approval for loaner service is based on credit verification.

  24 Hour Turnaround Swap Service:

  In the case that the defective board is within the first six (6) months of the warranty, CMD, at its own option, offers a 24 hour turnaround swap service. CMD will ship the same model of the board to customer within 24 hours during working days in exchange for the defective board. CMD will swap with a new board if board is not functional upon arrival. For all other cases, swap will occur with either a new or refurbished board for a charge of $200.00. CMD does not offer swap services for boards that are purchased more than six months from the date of shipment. Customer is responsible for returning the defective board to CMD within seven (7) days after receipt of the swapped board.
- The remaining warranty period shall apply to the repaired or swapped board.

Out-of-Warranty (more than 1 year)

- CMD offers a *15 working day turnaround repair service* at a rate of $300.00 plus parts and freight for all out-of-warranty host adapter boards. Defective boards will be repaired and returned to customer within 15 working days starting with date of return to CMD.
- CMD also offers an *Out-of-Warranty 24 Hour Turnaround Loaner Service:*

  Under this policy, CMD will ship the same model loaner in the 24 hour time frame of working days to customer for an additional charge of $100.00 plus freight per loaner. The loaner is for use by the customer during the period that the defective board is being repaired. Customer is responsible for returning the defective board to CMD within seven days after the receipt of loaner and returning the loaner in seven (7) days once the defective board is repaired and received. The approval of the loaner service is at CMD's option and based upon customer credit verification.
- CMD will extend warranty for a period of six (6) months on any out of- warranty repaired board.

Cable

In-Warranty (90 days) - free swap.

Out-of-Warranty (90 days) - not applicable.

Drive

In-Warranty (per manufacturer) - manufacturer charge only.

Out-of-Warranty (per manufacturer) - manufacturer charge plus $100 CMD handling.

RETURN FOR UPGRADE/ UPDATE

CMD Host Adapter

In-Warranty (less than 1 year)

- CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function; and a *free 15 working day turnaround ECO Field Upgrade* for all its boards. CMD will *upgrade* the hardware of its board to a higher function for a charge of the difference of list prices of the original and upgraded functions. CMD will also update its board to its latest firmware release at no charge to the customer. Boards will be upgraded/updated and returned to the customer within 15 working days from the date of return to CMD.
- CMD also offers *24 hour turnaround loaner service* as stated in "RETURN FOR REPAIR."
- The remaining warranty period shall apply to the updated board. For upgraded boards, CMD will extend warranty for a period of six months.

Out-of-Warranty (More than 1 year)

- CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function at a charge of the difference of list prices of two functions. CMD also offers a *free 15 working day turnaround ECO Field Upgrade* for all its boards. Boards will be upgraded/updated and returned to customer within 15 working days from the date of return to CMD.
- CMD also offers *24 hours turnaround Loaner Service* as stated in "RETURN FOR REPAIR."
- There will be no warranty extension for same function firmware update. For different function Hardware upgrade, CMD will extend warranty for a period of six (6) months.

Drive—same as in RETURN FOR REPAIR.

SHIPPING CHARGES

The following shipping charges apply to all REPAIR, SWAP, LOANER, and UPGRADE UNITS.

In-Warranty

- Domestic - freight from CMD to customer is to be paid by CMD; freight from customer to CMD is to be paid by customer.
- International - all fees are to be paid by customer (including custom duty and broker fees).

Out-of Warranty

- Domestic - all fees are to be paid by customer.
- International - all fees are to be paid by customer (including custom duty and broker fees).

GENERAL CONDITIONS

All goods returned to CMD including returns for credit, swap returns, loaner returns, and evaluation returns shall remain in good condition. Any damage or alteration done by the customer will result in a rejection or additional charge to the customer.

Customer must consult CMD Technical Support for authorization of CMD not functional upon arrival boards and swap requests. CMD Sales personnel must be consulted for authorization of returned goods for credit and/or evaluation.

Preface

The CDI-4000 Rev 1.2 contains the following changes to the previous revision of the CDI-4000 DSSI™ to SCSI Adapters manual:

- Chapter 3 has been separated into Chapters 3 through 7; and Chapter 4 has become Chapter 8:
    - Chapter 3 contains DSSI node ID, hardware configuration, and general installation procedures.
    - Chapter 4 contains CDI-4000-SAE, CDI-4000SA1, and CDI-4000SA2 installation procedures.
    - Chapter 5 contains CDI-4000-SB installation procedures.
    - Chapter 6 contains CDI-4000-SC installation procedures.
    - Chapter 7 contains new CDI-4000-SDA, CDI-4000SDB, and CDI-4000SDC installation procedures.

Table of Contents

1 **Introduction** 1-1

- How to Use This Manual 1-1
- Conventions 1-2

2 **Features and Components** 2-1

- Features 2-1
  - CDI-4000 Models 2-2
  - DSSI and SCSI Bus Cabling 2-3
  - Host Computer to CDI-4000 2-3
  - CDI-4000 to SCSI Devices 2-4
- Components 2-5
  - Ports and Connectors 2-5
  - LED Indicators 2-7

3 **Hardware Configuration and Installation** 3-1

- Determining DSSI Node ID 3-1
- Hardware Configuration 3-2
- General Installation 3-8

4 **CDI-4000-SA Installation** 4-1

- Installing CDI-4000-SAE and Elite Drives into VAX 4000 4-1
- CDI-4000-SA1 and Universal Drive Installation into VAX 4000 4-12
- Installing CDI-4000-SA2 and 3 1/2-inch Drives into VAX 4000 4-20

5 **CDI-4000-SB Installation** 5-1

- Installing CDI-4000-SB into MicroVAX 3300 and 3400 5-1

6 **CDI-4000-SC Installation** 6-1

- CDI-4000-SC Installation into TRIMM DA40 or DA60 6-1

7 **CDI-4000-SD Installation** **7-1**
Installing CDI-4000-SDA or CDI-4000-SDB into Shoebox 7-2
Installing CDI-4000-SDC into TRIMM TWR-540-231 Tower 7-11
Installing CDI-4000-SDC into TRIMM DA40 or DA60 7-17
Installing CDI-4000 onto Half-Height LCD Holding Bracket 7-23

8 **DUP Utility** **8-1**
DUP Utility Using Console 8-1
DUP Utility Using VMS 8-7
LCD Front Panel Configuration 8-7
    Front Panel LED Indicators 8-7
    Initial Power-On Display 8-8
    LCD Keys 8-9
    Main Setup Menu 8-9
    System-Wide Parameters Menu 8-10
    Device Parameters Menu 8-13
    Overview 8-14
Naming Conventions Example 8-14

Appendices

A **Supported Systems and Devices** **A-1**
Systems Supported A-1
Operating System Supported A-1
SCSI Devices A-1
    Magnetic disk drives A-1

B **Troubleshooting** **B-1**
Cables B-1
LED Indicators B-1
CMD Technical Support B-1

C **Connectors and Jumper Settings** **C-1**
Connectors C-1
Jumper Settings C-6

D **Advanced VAXclustering** **D-1**
System Information D-1
Figuring Your System Configuration D-4

Glossary G-1

Index I-1

List of Figures

2 Features and Components

2-1: CDI-4000 DSSI and SCSI ports 2-1
2-2: CDI-4000 components 2-6
2-3: LED Indicators 2-7

3 Hardware Configuration and Installation

3-1: Configuration prior to CDI-4000 installation 3-2
3-2: DSSI Node ID and SCSI ID configurations 3-3
3-3: DSSI port termination 3-5
3-4: SCSI port active termination 3-6
3-5: SCSI port passive termination 3-7
3-6: Shoebox installation example 3-9
3-7: Cable connection 3-10
3-8: Host Computer DSSI connection 3-11
3-9: DSSI port (J1) cable connection 3-12
3-10: SCSI port (J2) cable connection 3-13
3-11: Power connection 3-14

4 CDI-4000-SA Installation

4-1: CDI-4000-SAE drive installation 4-2
4-2: CDI-4000-SAE fan bracket installation 4-3
4-3: CDI-4000-SAE SCSI cable connection 4-4
4-4: CDI-4000-SAE DSSI cable connection 4-5
4-5: CDI-4000-SAE power connections 4-6
4-6: CDI-4000-SAE board and mylar installation 4-7
4-7: CDI-4000-SAE ISE and drive alignment 4-8
4-8: CDI-4000-SAE ISE and drive installation 4-9
4-9: CDI-4000-SAE front panel connections 4-10

4-10: CDI-4000-SAE front panel installation 4-11
4-11: CDI-4000-SA1 drive installation 4-12
4-12: CDI-4000-SA1 SCSI cable connections 4-13
4-13: CDI-4000-SA1 DSSI and SCSI cabling 4-14
4-14: CDI-4000-SA1 power connections 4-15
4-15: Mounting mylar and standoffs, CDI-4000-SA1 4-16
4-16: CDI-4000-SA1 board mounting 4-17
4-17: CDI-4000-SA1 ISE and drive installation 4-18
4-18: CDI-4000-SA1 front panel connections 4-19
4-19: CDI-4000-SA1 ISE front panel installation 4-20
4-20: CDI-4000-SA2 drive installation 4-21
4-21: Mounting mylar for CDI-4000-SA2 4-21
4-22: CDI-4000-SA2 power connection 4-22
4-23: CDI-4000-SA2 SCSI cable connections 4-23
4-24: CDI-4000-SA2 DSSI cable connections 4-24
4-25: CDI-4000-SA2 board mounting 4-25
4-26: CDI-4000-SA2 right bracket installation 4-26
4-27: CDI-4000-SA2 ISE and drive alignment 4-27
4-28: CDI-4000-SA2 ISE connections 4-28
4-29: CDI-4000-SA2 ISE front panel installation 4-29

5 CDI-4000-SB Installation

5-1: Connecting mylar to the CDI-4000 5-2
5-2: SCSI cable connection 5-3
5-3: Mounting the CDI-4000 onto the drive 5-4
5-4: Mounting the brackets to the drive 5-5
5-5: Removing the MicroVAX front panel 5-6
5-6: Removing the DSSI control panel 5-7
5-7: Installing the bracket into the MV cavity 5-8
5-8: Sliding the drive into the cavity 5-9
5-9: Power connections 5-10

6 CDI-4000-SC Installation

6-1: Mounting bracket installation 6-3
6-2: SCSI port (J2) cable connection 6-4
6-3: Mouting the CDI-4000 into DA40 6-5
6-4: Installing the DSSI bracket 6-6
6-5: DSSI port (J1) cable connection 6-7
6-6: Host Computer DSSI connection 6-8

6-7: Power connection 6-9
6-8: DA40 Fan Compartment with Mate-N-Lok 6-10
6-9: DA60 Fan Compartment with Mate-N-Lok 6-11
6-10: Connecting J5 and J6 6-12
6-11: LCD module (back view) 6-14

7 CDI-4000-SD Installation

7-1: Mounting the CDI-4000 7-3
7-2: Installing the DSSI bracket 7-4
7-3: DSSI ports for shoebox 7-5
7-4: Host Computer DSSI connection 7-6
7-5: SCSI port (J2) cable connection 7-7
7-6: Power connection 7-8
7-7: Connecting rainbow cable to J8 7-9
7-8: Mounting the CDI-4000 7-11
7-9: Slide the tray into the tower 7-12
7-10: Installing the DSSI bracket 7-13
7-11: DSSI port for tower 7-14
7-12: Sliding the tray into the DA40 or DA60 7-18
7-13: Installing the DSSI bracket 7-19
7-14: DSSI port for TRIMM DA40 or DA60 7-20
7-15: Power connection 7-21
7-16: Connecting the CDI-4000 and mylar 7-23
7-17: Mounting CDI-4000 to LCD holding bracket 7-25

8 DUP Utility

8-1: Example of DSSI node ID configuration 8-2
8-2: Example of CDI-4000 configuration 8-3
8-3: Example of CDI-4000 configuration 8-5
8-4: Example of DSSI device configuration 8-6
8-5: LCD Display Parameters 8-14
8-6: Naming Conventions 8-14

Appendices

C Connectors and Jumper Settings

C-1: Non-shielded SCSI device connector C-1
C-2: J4 C-3
C-3: J6 and J5 C-4

D Advanced VAXclustering

D-1: Example of VAXcluster D-3

List of Tables

2 Features and Components

2-1: CDI-4000 Models and Options 2-2
2-2: Active/Passive Termination Selection 2-5
2-3: Ports and Connectors 2-5
2-4: LED Indicators 2-7

3 Hardware Configuration and Installation

3-1: DSSI Port Node ID Jumper Selections 3-3
3-2: Initiator SCSI Port ID Jumper Selections 3-4
3-3: CDI-4000 Models Kit Assembly Installation Procedures 3-8

6 CDI-4000-SC Installation

6-1: LCD LED's and Drive SCSI IDs 6-13

7 CDI-4000-SD Installation

7-1: LCD LEDs and Drive SCSI IDs 7-10
7-2: LCD LEDs and Drive SCSI IDs 7-16
7-3: LCD LEDs and Drive SCSI IDs 7-22

8 DUP Utility

8-1: LCD Keys 8-9

Appendices

C Connectors and Jumper Settings

C-1: Connectors C-1
C-2: SCSI Port (J2) Connector Pin Assignments C-2
C-3: J4, RS-232 Port Connector Pin Assignments C-3
C-4: J5, LCD Display Port Connector Pin Assignments C-4

C-5: J6, ISE and LCD Front Panel Connector Pin Assignments C-5
C-6: DSSI Port (J1) ID Jumper Selections C-6
C-7: SCSI Port (J2) ID Jumper Selections C-6
C-8: Jumper Settings C-7
C-9: Jumper Settings on LCD Front Panel Display C-7

D Advanced VAXclustering

D-1: System 1, DSSI Bus 0 D-2
D-2: System 1, DSSI Bus 1 D-2
D-3: System 2, DSSI Bus 0 D-3
D-4: System 3, DSSI Bus 0 D-3
D-5: System _____, DSSI Bus _____ D-4
D-6: System _____, DSSI Bus _____ D-4
D-7: System _____, DSSI Bus _____ D-5
D-8: System _____, DSSI Bus _____ D-5

1

Introduction

This User's Guide details the features, installation, and operation of your CDI-4000™. It includes information on setting up and configuring the system for use.

How to Use This Manual

This guide has eight chapters and four appendices. Each chapter explains a different aspect of preparing your system and CDI-4000 for use. You may refer to the appendices for further configuration and troubleshooting information. The following descriptions summarize each section.

Chapter 1: Introduction explains the purpose of this guide and details the conventions used.

Chapter 2: Features and Components describes the CDI-4000 and details its distinct features.

Chapter 3: Hardware Configuration and Installation describes procedures for configuring the CDI-4000, installing the CDI-4000-AA, CDI-4000-AB, CDI-4000-AC into a general system or storage box. This chapter also describes how to install SCSI devices and terminate the DSSI and SCSI buses.

Chapter 4: CDI-4000-SA Installation describes procedures for installing the CDI-4000-SA, the ISE canister kit, both Elite and universal 5¼-inch drives, and two 3½-inch drives in one ISE canister kit into the VAX 4000.

Chapter 5: CDI-4000-SB Installation describes procedures for installing the CDI-4000-SB and SCSI devices into the MicroVAX 3300 and 3400.

Chapter 6: CDI-4000-SC Installation describes procedures for installing the CDI-4000-SC and the LCD Display Panel into the TRIMM DA40 or DA60.

Chapter 7: CDI-4000-SD Installation describes procedures for installing the CDI-4000-SD half-height LCD assembly into various external chassis including a shoebox, tower, and TRIMM DA40 or DA60. Instructions are also given for mounting the CDI-4000 to the half-height LCD holding bracket.

Chapter 8: DUP Utility describes how to configure the operating system and the CDI-4000 using the DUP Utility from the system console, VMS, and the LCD Display Panel.

Appendix A: Supported Devices and Operating systems lists the SCSI devices and operating systems compatible with the CDI-4000.

Appendix B: Troubleshooting gives some troubleshooting guidelines for the CDI-4000.

Appendix C: Connectors and Jumper Settings lists all connectors and jumper settings for the CDI-4000.

Appendix D: Advanced VAXclustering describes how to configure your computing environment for advanced VAXclustering.

Conventions

The following conventions are used in the CDI-4000 User's Guide.

Keycaps—Characters in square brackets represent keys on your keyboard. For example, "Press [ENTER]" means press the [ENTER] key. When two or more keys are joined by a plus sign (+), press those keys at the same time.

Commands—Text in italics represent commands that can be used on a system, such as *show dev*.

NOTE Sometimes italics are used for emphasis; for example, *do not* remove jumper shunt W13.

Entering Text or Commands on Screen—Text or commands that must be entered on screen are bolded italics as ***show dev di***; be sure to type the text or command and press [ENTER].

2

Features and Components

The CDI-4000 is a DSSI to SCSI adapter which allows you to connect devices such as hard disk drives, erasable optical drives (without any software patches or special drivers), CD-ROM drives, and WORM drives to a system such as the VAX 4000 and MicroVAX 3300.

Features

For purposes of this manual, the port connecting to the host computer, J1 on the CDI-4000, is called the DSSI Port. The port connecting to the SCSI devices, J2, is called the SCSI Port. These devices may include disk, optical drives, CD-ROM, and WORM drives. The CDI-4000 plays a role of initiator to the SCSI devices from J2, see Figure 2-1.

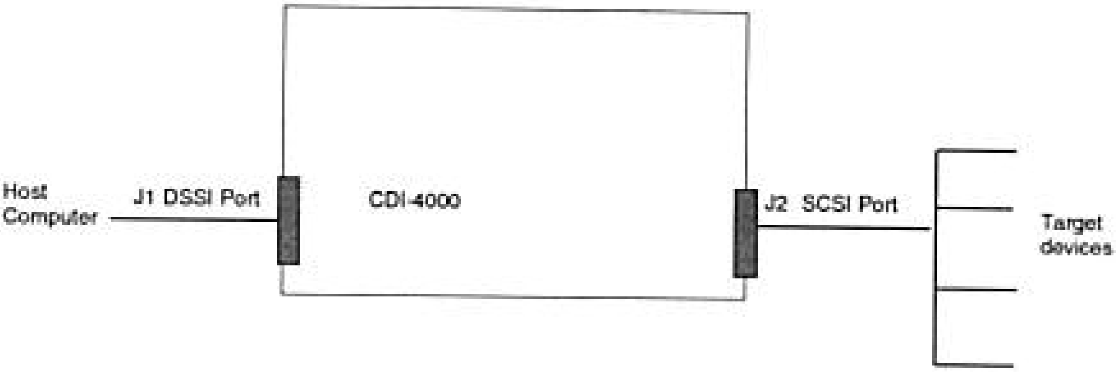

Figure 2-1: CDI-4000 DSSI and SCSI ports

CDI-4000 Models

The following is a list of the different models and options for the CDI-4000.

Table 2-1 CDI-4000 Models and Options

Model	Features	Supported
CDI-4000-AA	The DSSI to SCSI adapter	1 SCSI device
CDI-4000-AB	The DSSI to SCSI adapter	2 SCSI devices
CDI-4000-AC	The DSSI to SCSI adapter	7 SCSI devices
CDI-4000-SAE	The DSSI to SCSI adapter; the ISE (integrated storage element) kit for integrating one Seagate® Elite drive into any VAX 4000 cabinet.	1 SCSI device
CDI-4000-SA1	The DSSI to SCSI adapter; the ISE (integrated storage element) kit for integrating one universal drive into any VAX 4000 cabinet.	1 SCSI device
CDI-4000-SA2	The DSSI to SCSI adapter; the ISE (integrated storage element) kit for integrating one 5¼-inch drive or two 3½-inch drives into one VAX 4000 slot.	2 SCSI device
CDI-4000-SB	The DSSI to SCSI adapter; the MicroVAX kit for complete integration into any DSSI-based MicroVAX cabinet.	1 SCSI device
CDI-4000-SC	The DSSI to SCSI adapter; the LCD Display Panel for easy integration into Rack Mount TRIMM® DA40 or DA60, Table Top, or Desktop subsystem packages.	7 SCSI devices
CDI-4000-SDA	The DSSI to SCSI adapter; the half-height LCD assembly for easy integration into shoebox.	1 SCSI devices
CDI-4000-SDB	The DSSI to SCSI adapter; the half-height LCD assembly for easy integration into shoebox.	2 SCSI devices
CDI-4000-SDC	The DSSI to SCSI adapter; the half-height LCD assembly for easy integration into shoebox, tower or TRIMM DA40 or DA60.	7 SCSI devices
CDI-4000-ISE	The ISE (integrated storage element) kit for integration into any VAX 4000 cabinet Front Panel Bezel with control panel and drive canister for mounting 5¼-inch SCSI device and necessary cables.	
CDI-4000-MV	The MicroVAX kit for complete integration into any DSSI-based MicroVAX cabinet; includes mounting assembly and necessary cables.	
CDI-4000-LCD	The LCD Display Panel for easy integration into Rack Mount TRIMM DA40 or DA60, Table Top, or Desktop subsystem packages.	

DSSI and SCSI Bus Cabling

The CDI-4000 contains one 50-pin DSSI port, J1, and one 50-pin SCSI port, J2 connected to the SCSI devices. When the CDI-4000 and the SCSI devices are installed in the same cabinet which meets EMI/RFI shielding requirements, a 25-signal twisted-pair cable must be used for connecting the Host, the CDI-4000 (at J2) and the SCSI devices. When the CDI-4000 and the SCSI devices are installed in separate cabinets, a shielded SCSI cable should be used to meet FCC requirements.

A minimum conductor size of 28 AWG must be used to minimize noise effects and ensure proper distribution of optional terminator power. The maximum cable length is 6.0 meters or 20 feet in single-ended mode.

Host Computer to CDI-4000

This section details the DSSI Port and proper termination for J1 through use of terminator resistors and terminator power.

DSSI Port

J1 on the CDI-4000 is a 50-pin DSSI connector which connects to the host computer. The CDI-4000, to the host computer, looks very much like an ordinary DSSI device.

Each device on the DSSI bus requires a unique identification address (specifically 0-7). ID 7 has the highest priority on the bus and ID 0 has the lowest priority. The CDI-4000 is factory configured to 0, at J1. Select a DSSI ID for the CDI-4000 that is not currently being used on the system (to check ID number perform *show device*). See Chapter 3 for DSSI Node ID selections from on-board jumpers.

Termination at J1

Terminator resistors, RN2 and RN4, are removable 270-ohm and RN1 and RN3 are removable 120-ohm terminator resistor packs for the J1 DSSI Port. DSSI bus specifications require the cable to be terminated at both *physical* ends. Termination is usually required at J1 on the CDI-4000 if it is at the end of the DSSI cable. See Chapter 3 for proper termination instructions.

The CDI-4000 can supply power to the TERMPWR (pin 23 through 28) of the DSSI connector J1 through a diode, a fuse (F1), and a jumper (W1). If the host computer does not supply terminator power, place jumper shunt on W1 (see Chapter 3 for termination instructions).

CDI-4000 to SCSI Devices

This section details the SCSI Port and proper termination for J2 through the use of terminator resistors and terminator power.

SCSI Port

J2 on the CDI-4000 is a 50-pin single-ended SCSI connector which connects to the target devices. The CDI-4000 is factory configured to SCSI ID 7 at J2. See Chapter 3 for SCSI Port ID settings from on-board jumpers.

Since the CDI-4000 is factory configured to SCSI ID 7, the SCSI ID of the target devices connected to the CDI-4000 should be set from SCSI ID 0 to 6 starting at SCSI ID 0.

Termination at J2

Terminator resistors, RN16, RN17, and RN18, are removable 220/330-ohm passive or 110-ohm active (factory set) terminator resistor packs for J2. SCSI bus specifications requires the cable to be terminated at both *physical* ends of the SCSI bus. It is recommended that these resistors remain in place if the CDI-4000 (at J2) is at one *physical* end of the cable.

The CDI-4000 supplies terminator power to the TERMPWR pin (pin 26) of SCSI connector (J2) through a fuse (F2), a diode, and jumper block W12. To install terminator power, install W12. Since the J2 SCSI port acts like an initiator to the target devices on the bus, W12 should remain installed.

Any SCSI terminator (on-drive or external) needs to be powered by at least one SCSI device, otherwise the SCSI signals will be pulled down. Typically, an initiator (SCSI host adapter) provides the power to the on-board terminator, the external SCSI terminator, or the on-drive terminator when the drive is powered OFF.

Anytime an external SCSI terminator (instead of an on-drive SCSI terminator) is used, the SCSI terminator power option of the CDI-4000 must be enabled at jumper shunt W12.

Active/Passive Termination

The CDI-4000 has a new feature that allows you to select active or passive termination for J2 SCSI connector. Active termination contains resistor networks and a voltage regulator. Passive termination contains only resistor networks. Refer to "Termination at J2" in this chapter for specifications on ohms. Table 2-2 details jumper settings for active/passive termination.

Table 2-2 Active/Passive Termination Selection

W11	1-2 IN	Active Termination enabled for SCSI port J2 (F)
W11	2-3 IN	Passive Termination enabled for SCSI port J2

Note that (F) means factory setting.

Components

This section details the CDI-4000 components.

Ports and Connectors

Table 2-3 lists the ports and connectors on the CDI-4000.

Table 2-3 Ports and Connectors

J1	DSSI Interface
J2	SCSI Interface
J3	Power connector
J4	Serial Port for RS-232 Interface
J5	LCD Interface
J6	ISE or LCD Interface

Figure 2-2 illustrates the CDI-4000.

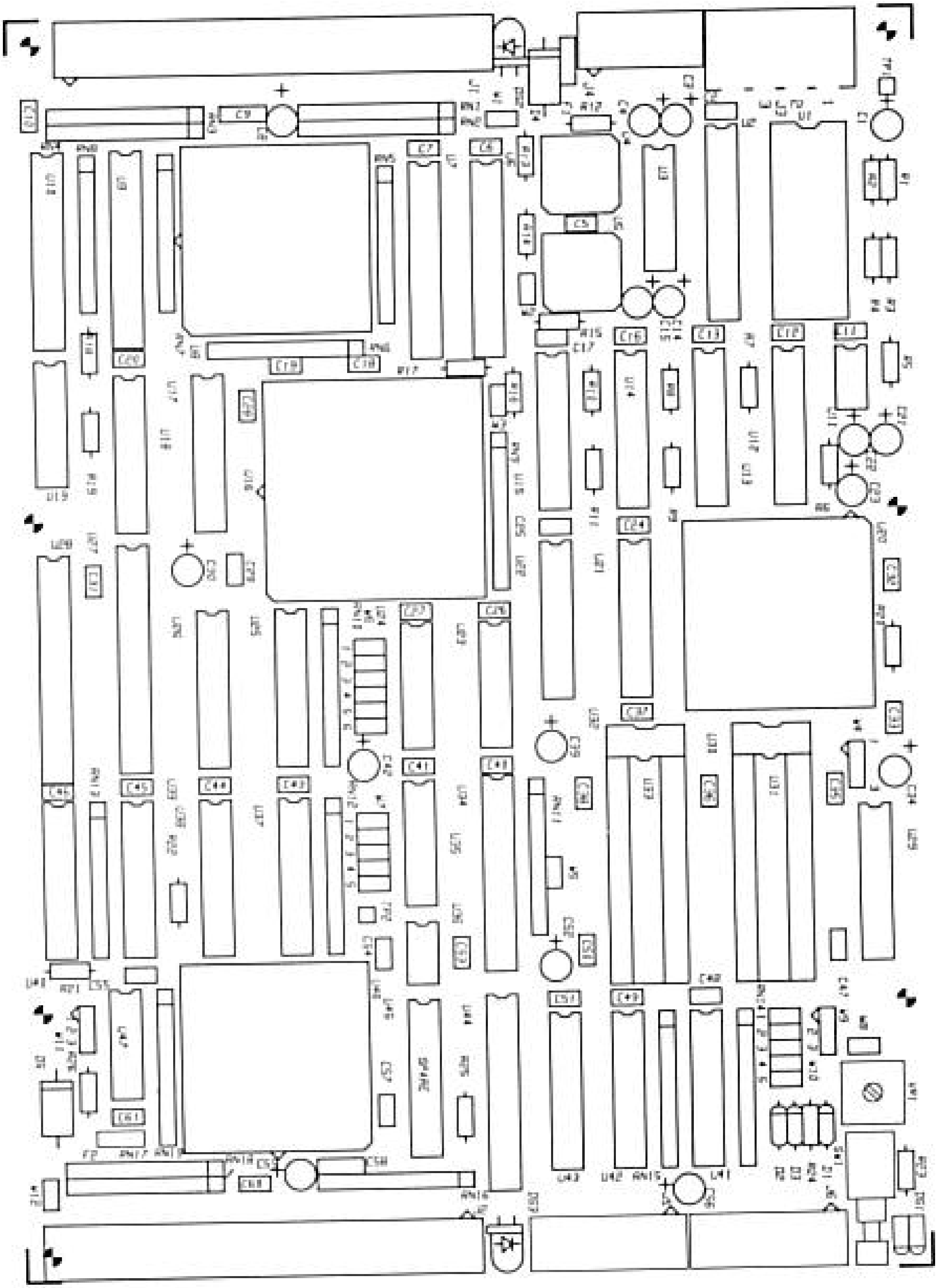

Figure 2-2: CDI-4000 components

LED Indicators

LED indicators light up when the CDI-4000 is installed and powered "ON." The green lights indicate normal functions of the CDI-4000; the red light indicates a possible problem. DS1 is located next to J6, DS2 is next to J1, and DS3 is next to J2.

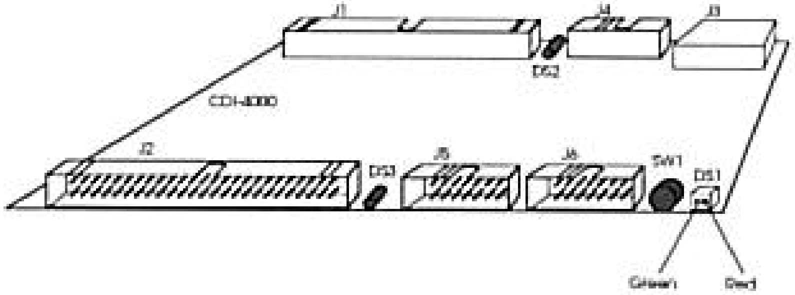

Figure 2-3: LED Indicators

Table 2-4 lists the LED indicators for the CDI-4000.

Table 2-4 LED Indicators

DS1	Green LED. This LED blinks during SCSI activity. Red LED, blinks 15 times upon bootup. This LED is "ON" if there is an error condition.
DS2	This LED will be "ON" whenever TERMPWR is active on the DSSI bus, at J1. This includes TERMPWR supplied by the CDI-4000 or other device(s) on the DSSI bus.
DS3	This LED will be "ON" whenever TERMPWR is active on the SCSI bus. This includes TERMPWR supplied by the CDI-4000 or other device(s) on the SCSI bus.
SW1	Reset Switch

3

Hardware Configuration and Installation

Hardware Configuration and Installation involves determining DSSI node ID, configuring the hardware, terminating each end of the DSSI and SCSI buses, identifying each port, and general installation procedures for the CDI-4000 and SCSI devices. This chapter is organized in sequence; refer to each section for procedures.

Determining DSSI Node ID

The CDI-4000 must have a unique node number on the DSSI bus. Since your VAX computer will most likely be configured for DSSI node IDs 7 or 6, the CDI-4000 node ID must be set to a unique node number starting from 0 to 7. If another device on the DSSI bus has ID of 0, set the ID to 1, 2, 3, or another number up to 7.

NOTE J1's node ID must be set to the same ID that it is set to in the operating system software.

To determine the DSSI node ID for the CDI-4000, follow these steps.

WARNING **DO NOT connect the CDI-4000 to the system at this time!**

1 At the console prompt, >>>, enter:

```
>>>sho dev
```

The screen will display all devices and their respective node IDs, as shown in the example in Figure 3-1.

```
DSSI Node ID 5 (*)

UQSSP Disk Controller 0 (772150)
-DUA0 (RA82)

Ethernet Adapter
-ESA0 (08-00-2B-13-80-85)
```

Figure 3-1: Configuration prior to CDI-4000 installation

2 Determine a *unique* node ID (between 0 to 7) for the CDI-4000. Remember or note this ID number for configuring jumpers as shown in Table 3-1, DSSI Port Node ID Jumper Selections.

Hardware Configuration

Hardware configuration of the CDI-4000 may vary with each system and device. Due to the various options for configuring the CDI-4000, this section must be completed prior to installing the CDI-4000 and its respective SCSI devices. Upon completion of hardware configuration, see your respective "Installation" section or chapter (see Table 3-3).

1 Turn the host computer completely OFF.

2 Carefully unpack the CDI-4000 and place on a non-metallic surface.

WARNING **Be sure to wear anti-static wrist straps or equivalent to protect the CDI-4000 from electrostatic damage.**

3 Use the jumper selections in Table 3-1 and set DSSI Port node ID (J1) to the number specified in step 2 of "Determining DSSI Node ID."

Table 3-1 DSSI Port Node ID Jumper Selections

CDI-4000 DSSI Node ID	W6-1	W6-2	W6-3
7	IN	IN	IN
6	IN	IN	OUT
5	IN	OUT	IN
4	IN	OUT	OUT
3	OUT	IN	IN
2	OUT	IN	OUT
1	OUT	OUT	IN
0 (factory)	OUT	OUT	OUT

Figure 3-2 illustrates an example of configuring a system.

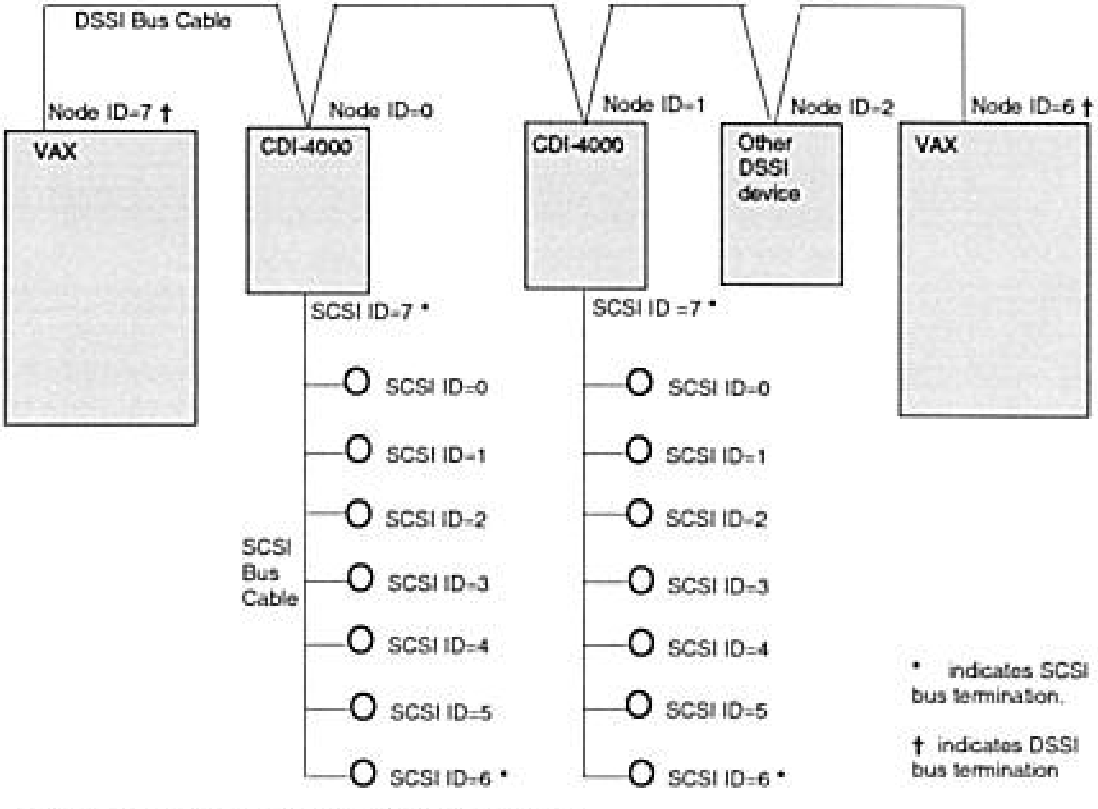

Figure 3-2: DSSI Node ID and SCSI ID configurations

4 Make sure jumpers are on W7-1, W7-2, and W7-3 to identify the SCSI port (J2) as ID 7. If another device on the SCSI bus has SCSI ID 7, set the J2 SCSI ID to 6, 5, 4, or another number down to 0 by placing jumpers over the pins as listed in Table 3-2 (see Chapter 2, section "CDI-4000 to SCSI Devices" for complete explanation of SCSI ID).

Table 3-2 Initiator SCSI Port ID Jumper Selections

CDI-4000 SCSI ID	W7-1	W7-2	W7-3
7 (factory)	IN	IN	IN
6	IN	IN	OUT
5	IN	OUT	IN
4	IN	OUT	OUT
3	OUT	IN	IN
2	OUT	IN	OUT
1	OUT	OUT	IN
0	OUT	OUT	OUT

5 Terminate each *physical* end of the DSSI bus connected at J1. If CDI-4000 is not at one end of the DSSI bus, *remove terminators* at J1. Follow the instructions below (see Figure 3-3):

To remove terminators at J1:
Remove the four (4) terminators in locations RN1, RN2, RN3, and RN4 from the CDI-4000 located near J1. Remove jumper shunt in W1 to disable TERMPWR at J1.

WARNING RN1 and RN3 are 120 ohm; RN2 and RN4 are 270 ohm.

To install terminators at J1:
Put four (4) terminators in locations RN1, RN2, RN3, and RN4 near J1 (numbers must face J1). Put jumper shunt in W1 to supply TERMPWR (make sure the host computer is not supplying terminator power).

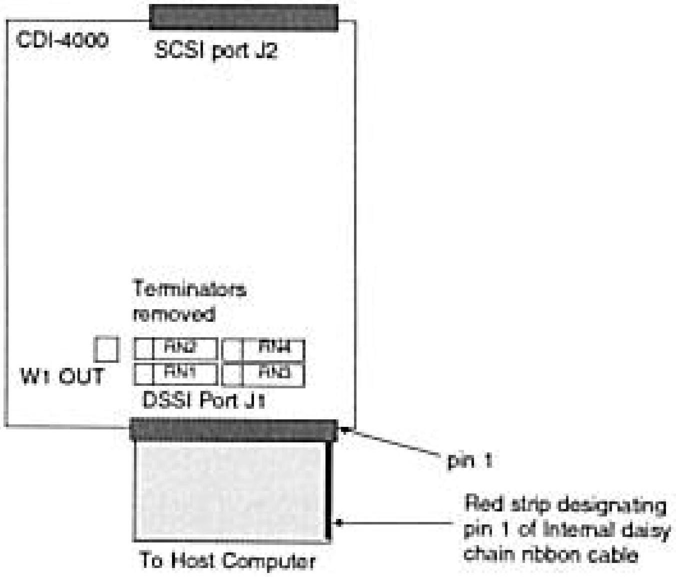

Figure 3-3: DSSI port termination

6 Terminate each *physical* end of the SCSI bus connected at J2. *DO NOT* terminate devices in the middle of the SCSI bus. If the CDI-4000 is in the middle of the SCSI bus, *remove terminators at J2.*

SCSI devices can be terminated directly on the device (see manufacturer's documentation) or by using an external terminator.

Active Termination
To install terminators at J2:
Put three (3) active 110-ohm terminators in locations RN16, RN17, and RN18 (active resistor numbers end in 111). Pin 1 of resistor must align with pin 1 of the socket shown by the white mark in the Figure 3-4.

Put jumper shunt in W12 (this allows for +5-volts to be sent to the external terminator at the end of the SCSI bus). See Figure 3-4.

NOTE Terminator pin 1 is marked by a dot.

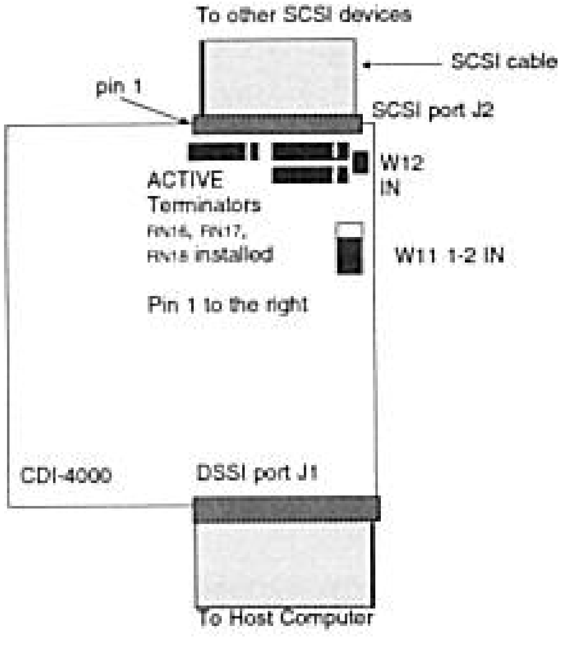

Figure 3-4: SCSI port active termination

WARNING **Install W11 1-2 IN for active termination; W11 2-3 IN for passive termination.**

Passive Termination

To install terminators at J2:

Put three (3) passive 220/330-ohm terminators in locations RN16, RN17, and RN18 (final numbers on the resistors must read 221331). Pin 1 of resistor must align with pin 1 of the socket shown by the white mark in the Figure 3-5).

Put jumper shunt in W12 (this allows for +5-volts to be sent to the external terminator at the end of the SCSI bus). See Figure 3-5.

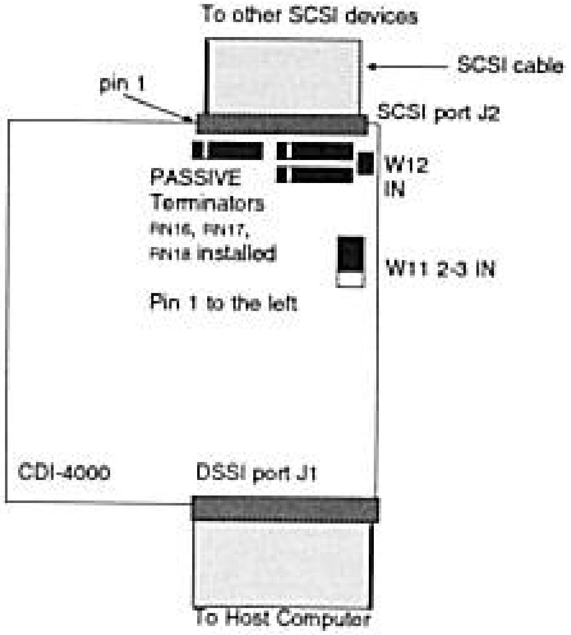

Figure 3-5: SCSI port passive termination

To remove terminators at J2:

Remove the three (3) terminators in locations RN16, RN17, and RN18, next to J2 on the CDI-4000. W12 may be removed if another device is supplying terminator power.

General Installation

The CDI-4000 may be installed inside the chassis of the SCSI device if space constraints allow, inside a storage box like the DEC BA42 Storage Expansion Box, or inside a system like the VAX system.

This section details installation procedures for the CDI-4000-AA, CDI-4000-AB, CDI-4000-AC and their respective SCSI devices without kit assemblies. For installation procedures for CDI-4000 with kit assemblies, see Table 3-3.

Table 3-3 CDI-4000 Models Kit Assembly Installation Procedures

Model	Kit Assembly and Enclosure	Chapter
CDI-4000-SAE, CDI-4000-SA1, CDI-4000-SA2	ISE canister kit for the VAX 4000	see Chapter 4
CDI-4000-SB	ISE canister kit for the MicroVAX	see Chapter 5
CDI-4000-SC	LCD Display Panel for TRIMM DA40 or DA60	see Chapter 6
CDI-4000-SDA, CDI-4000-SDB, CDI-4000-SDC	half-height LCD assembly for shoebox, tower, TRIMM DA40 or DA60	see Chapter 7

For general installation procedures of the CDI-4000-AA, CDI-4000-AB, and CDI-4000-AC (without kit assemblies), follow these instructions.

1 Carefully install the CDI-4000 into an assigned slot inside a storage box, shoebox, or system, see Figure 3-6 as an example.

WARNING ❶ **Make sure the CDI-4000 or any of its components are NOT directly touching metal surfaces.**
Attach plastic washers as specified in the drawing.

❷ **Make sure there is proper ventilation in the storage unit.**

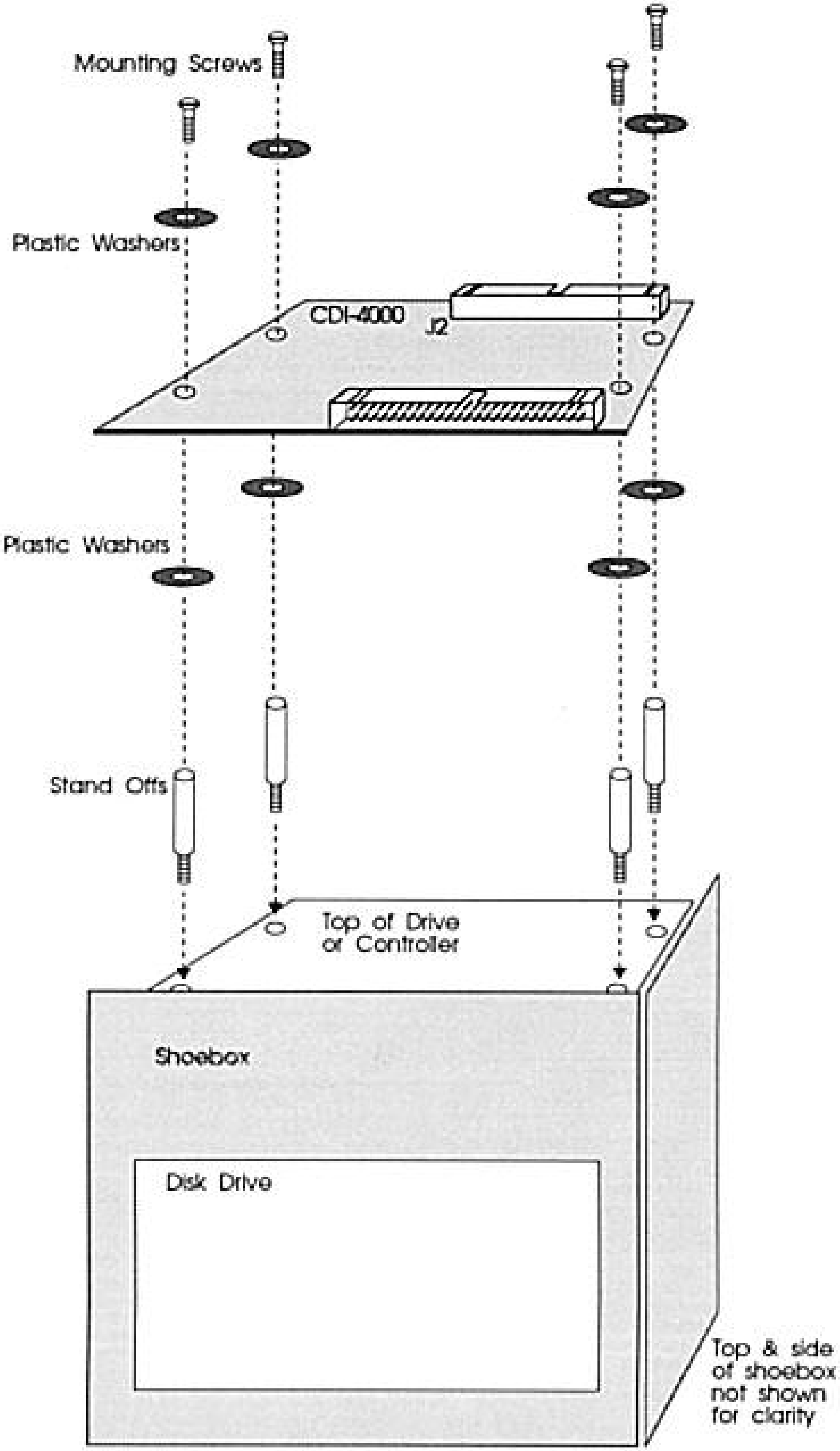

Figure 3-6: Shoebox installation example

2 If you are installing the CDI-4000 into a shoebox or system chassis, the connection will be similar to that shown in Figure 3-7.

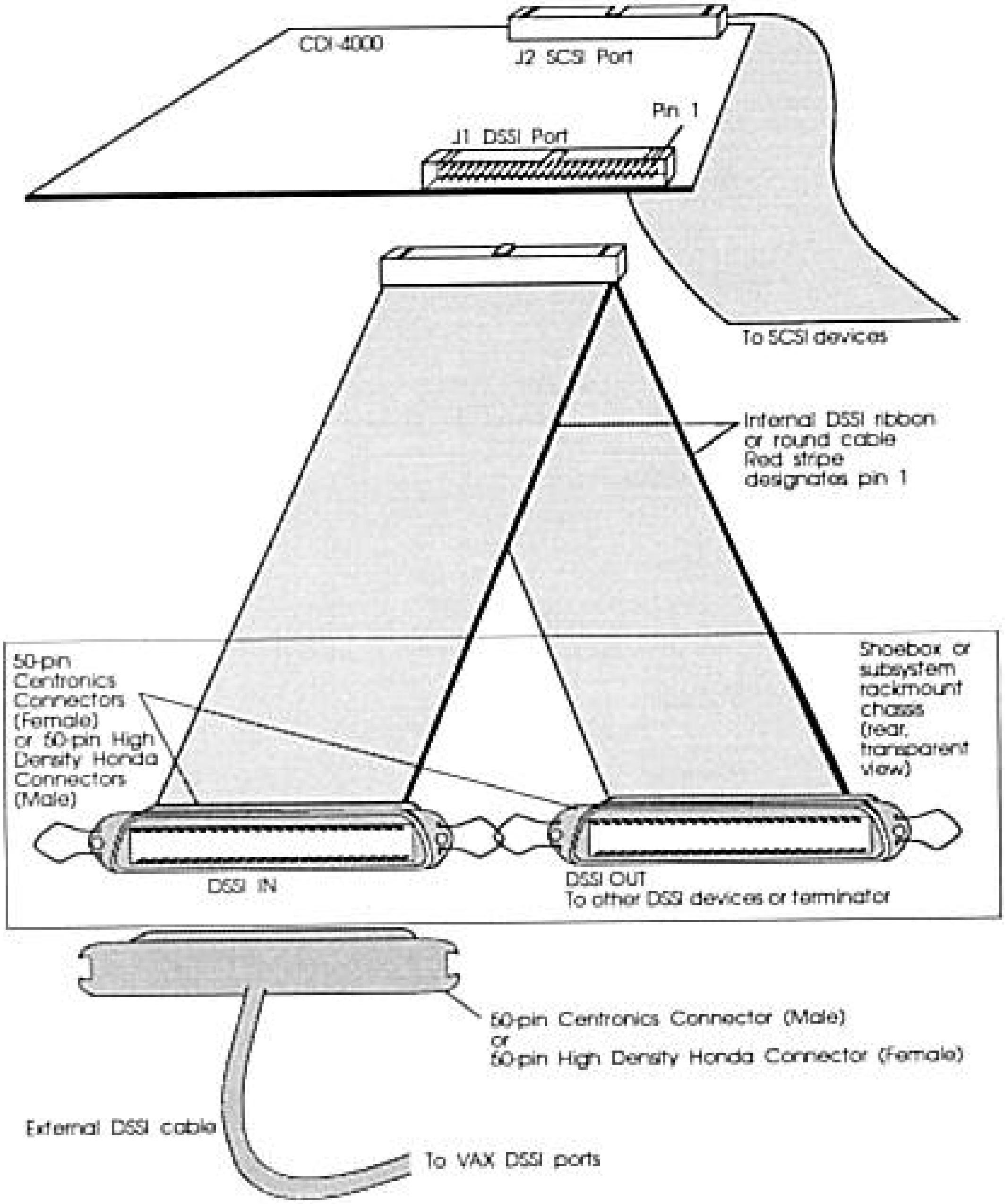
CDI-4000
J2 SCSI Port
Pin 1
J1 DSSI Port
To SCSI devices
Internal DSSI ribbon or round cable Red stripe designates pin 1
50-pin Centronics Connectors (Female) or 50-pin High Density Honda Connectors (Male)
Shoebox or subsystem rackmount chassis (rear, transparent view)
DSSI IN
DSSI OUT
To other DSSI devices or terminator
50-pin Centronics Connector (Male)
or
50-pin High Density Honda Connector (Female)
External DSSI cable
To VAX DSSI ports

Figure 3-7: Cable connection

3 Connect one end of the DSSI cable to the DSSI connector of the host computer as shown in Figure 3-8.

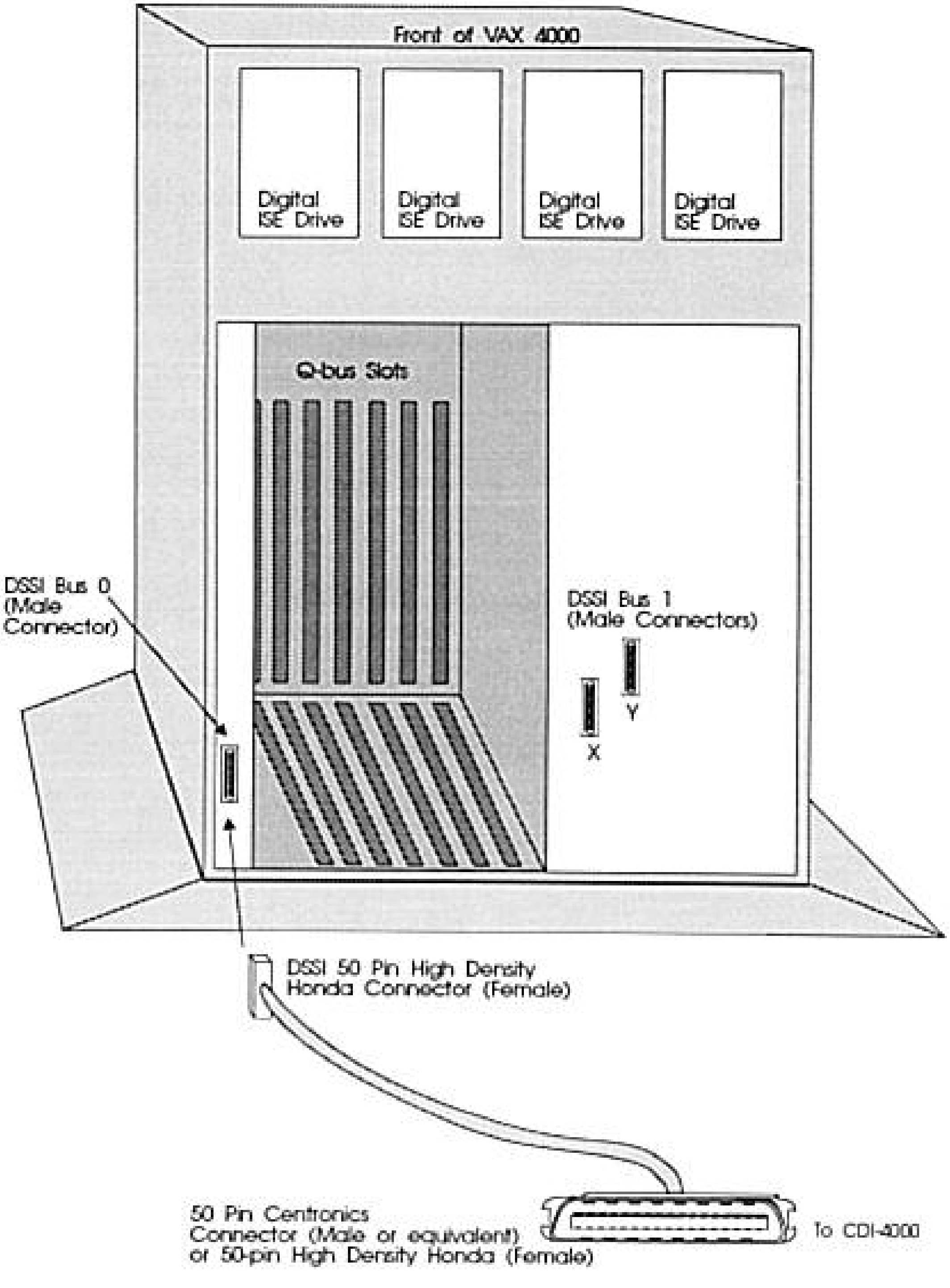
Front of VAX 4000
Digital ISE Drive
Digital ISE Drive
Digital ISE Drive
Digital ISE Drive
Q-bus Slots
DSSI Bus 0 (Male Connector)
DSSI Bus 1 (Male Connectors)
Y
X
DSSI 50 Pin High Density Honda Connector (Female)
50 Pin Centronics Connector (Male or equivalent) or 50-pin High Density Honda (Female)
To CDI-4000

Figure 3-8: Host Computer DSSI connection

4 Connect the other end of the DSSI cable to the CDI-4000 at J1, DSSI port as shown in Figure 3-9.

WARNING To prevent damage to the CDI-4000, pin 1 of the DSSI cable and pin 1 of J1 of the CDI-4000 *must* align.

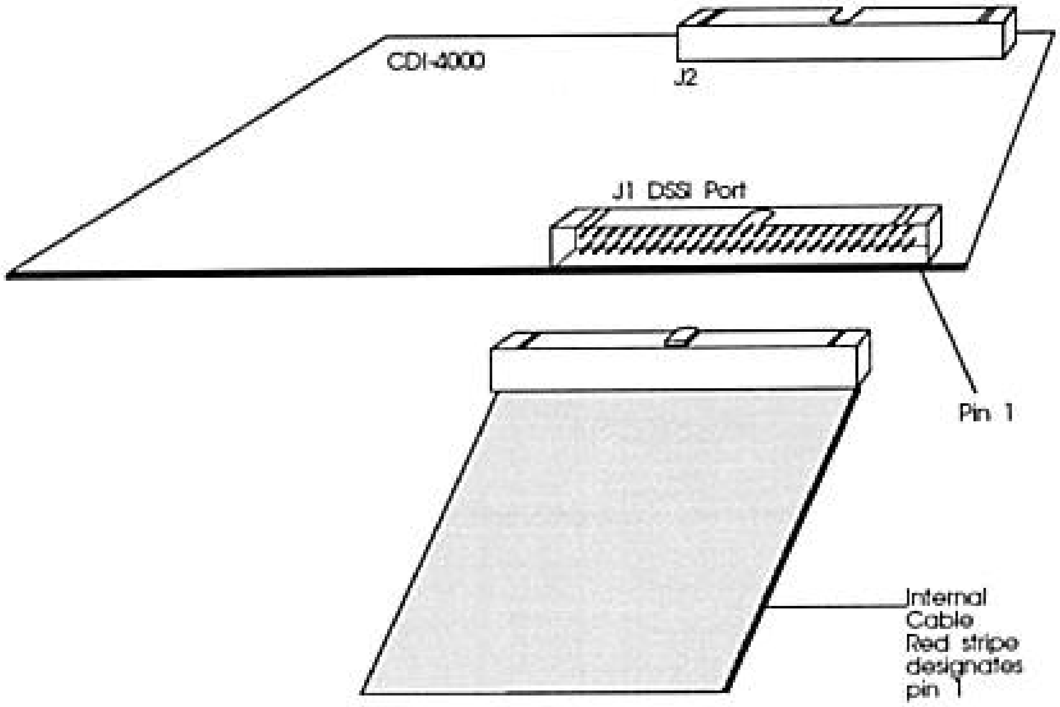

Figure 3-9: DSSI port (J1) cable connection

5 Connect one end of a SCSI cable to the CDI-4000 at J2, SCSI port (see Figure 3-10).

WARNING **To prevent damage to the CDI-4000, pin 1 of the SCSI cable and pin 1 of J2 of the CDI-4000 *must* align.**

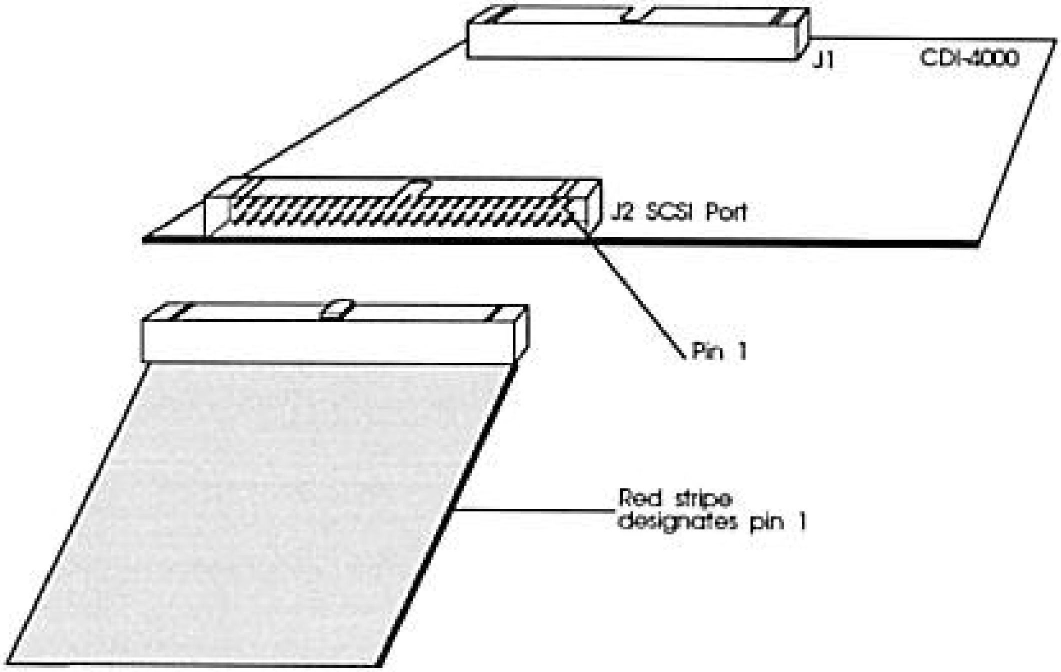

Figure 3-10: SCSI port (J2) cable connection

6 Connect the other end of the cable to the SCSI device (align pin 1's). Up to seven devices may be installed by correctly cabling to other SCSI devices.

7 Connect the 4-pin power cable to the power connector, J3. Be sure pin 1 from the cable is aligned with pin 1 on the CDI-4000 as shown in Figure 3-11.

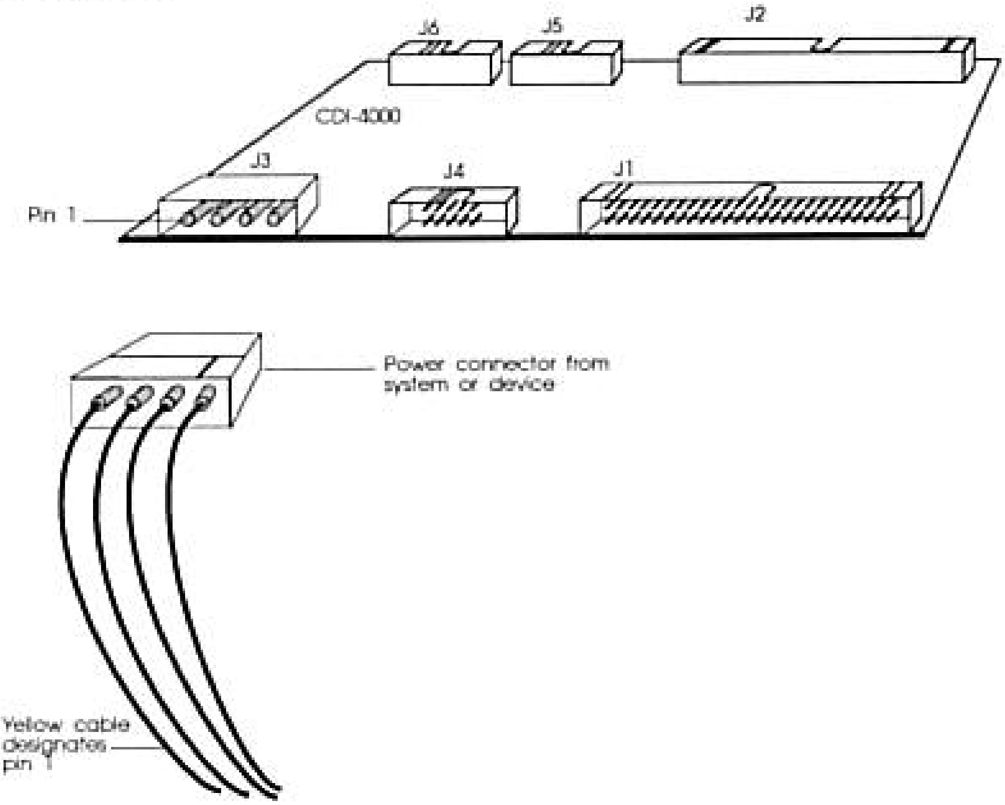
J6
J5
J2
CDI-4000
J3
J4
J1
Pin 1
Power connector from system or device
Yellow cable designates pin 1

Figure 3-11: Power connection

4

CDI-4000-SA Installation

CDI-4000-SA Installation involves installing the CDI-4000 into a VAX 4000, using both Elite and universal 3½-inch or 5¼-inch drives. CDI-4000-SAE, CDI-4000-SA1 and CDI-4000-SA2 along with the SCSI devices installation procedures are given in this section. For installing SCSI devices, terminating each end of the DSSI and SCSI buses, and identifying each port see Chapter 3, "Determining DSSI Node" and "Hardware Configuration."

Installing CDI-4000-SAE and Elite Drives into VAX 4000

If you have the CDI-4000-SAE, a Seagate Elite-I or Elite-II disk drive, and a VAX 4000, install the ISE, CDI-4000, and the drive by following these instructions.

1. Carefully unpack the drive from its frame and remove the four screws (two located on the sides and two on the bottom of the drive) if applicable.

WARNING **Be sure to wear anti-static wrist straps or equivalent to protect the drive and the CDI-4000 from electrostatic damage.**

2 Carefully install the drive into the disk holding tray of the ISE chassis. SCSI connector on the drive must face the floating connector on the ISE chassis. See Figure 4-1.

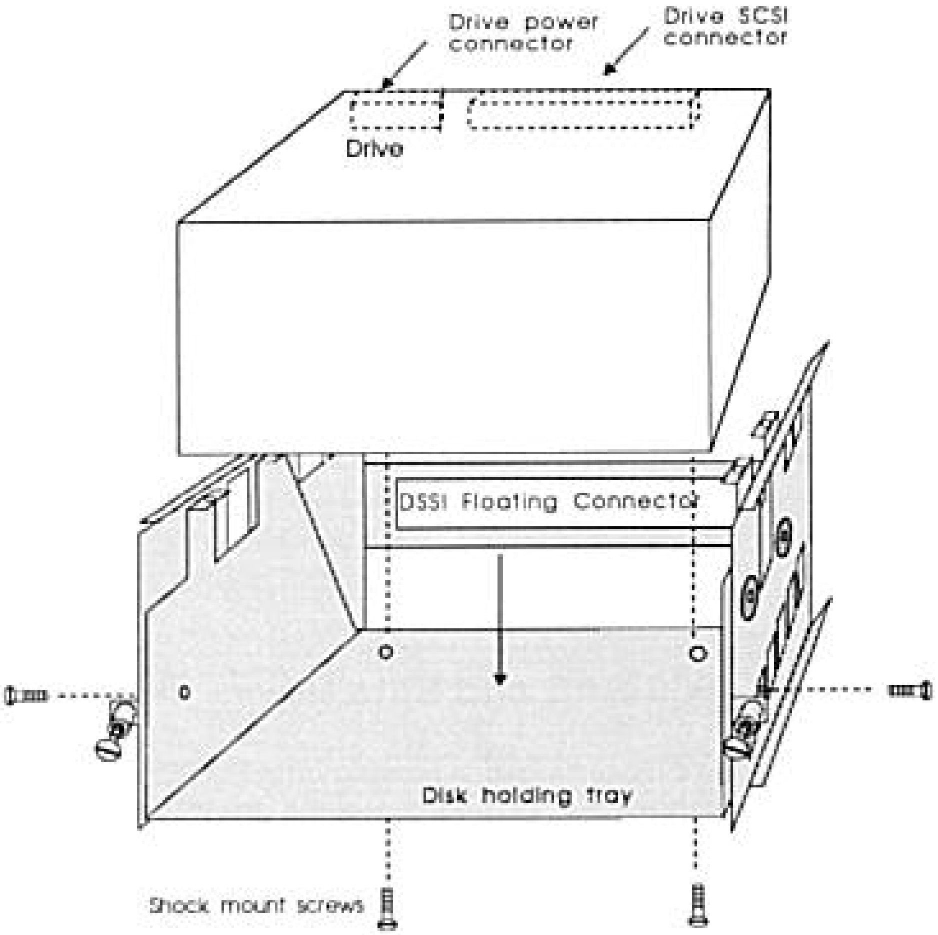

Figure 4-1: CDI-4000-SAE drive installation

3 Put four shock mount screws into the drive through the disk holding tray; two screws are located in the back bottom and two are located on each side of the disk holding tray. See Figure 4-1.

4 Install fan bracket by aligning the two notches on the left side of the fan bracket into the two slots of the left side of the ISE and the two holes into the bottom of the disk holding tray; put two screws into the fan bracket through the ISE. See Figure 4-2.

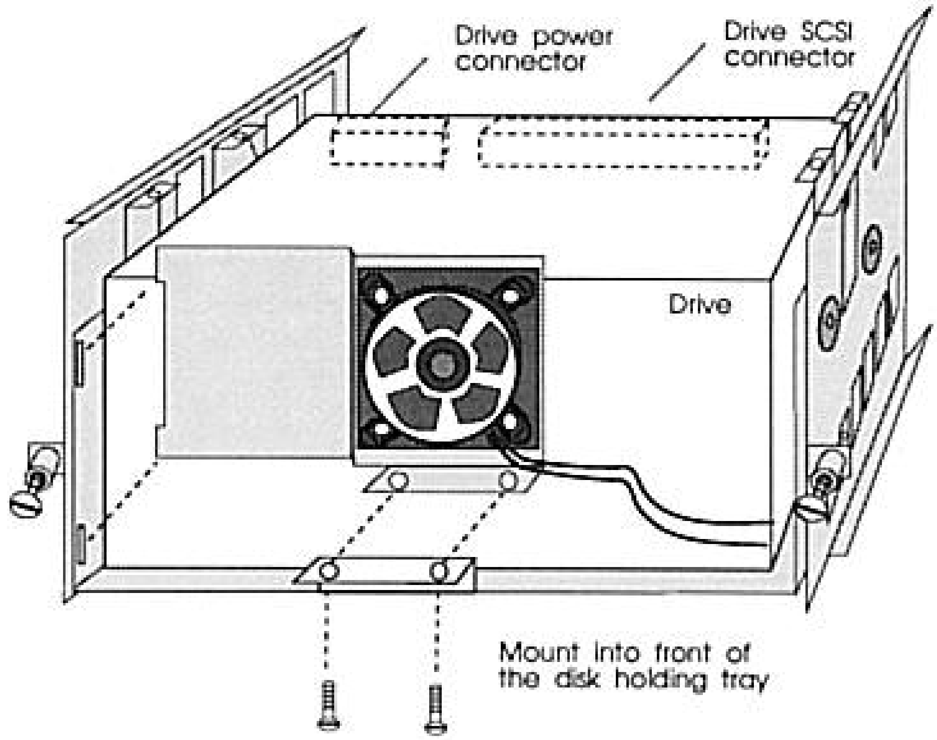

Figure 4-2: CDI-4000-SAE fan bracket installation

5 Connect the SCSI cable to J2 of the CDI-4000 and the SCSI connector on the back of the drive (component side of CDI-4000 must face drive). See Figure 4-3 and 4-4.

WARNING **To prevent damage to the CDI-4000, pin 1 of the SCSI cable and pin 1 of J2 of the CDI-4000 *must* align.**

NOTE SCSI cable will be laid between the CDI-4000 and the drive.

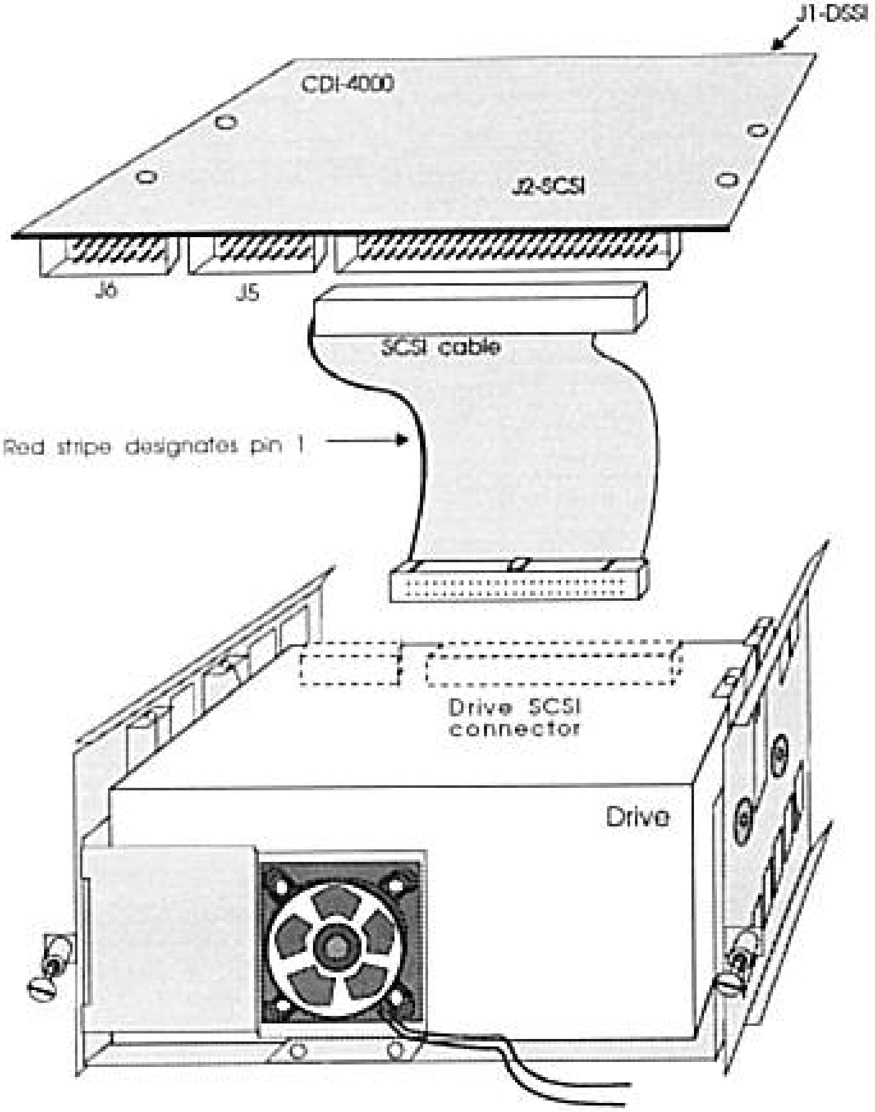

Figure 4-3: CDI-4000-SAE SCSI cable connection

6 Connect the DSSI cable from the floating connector to J1 of the CDI-4000. See Figure 4-4.

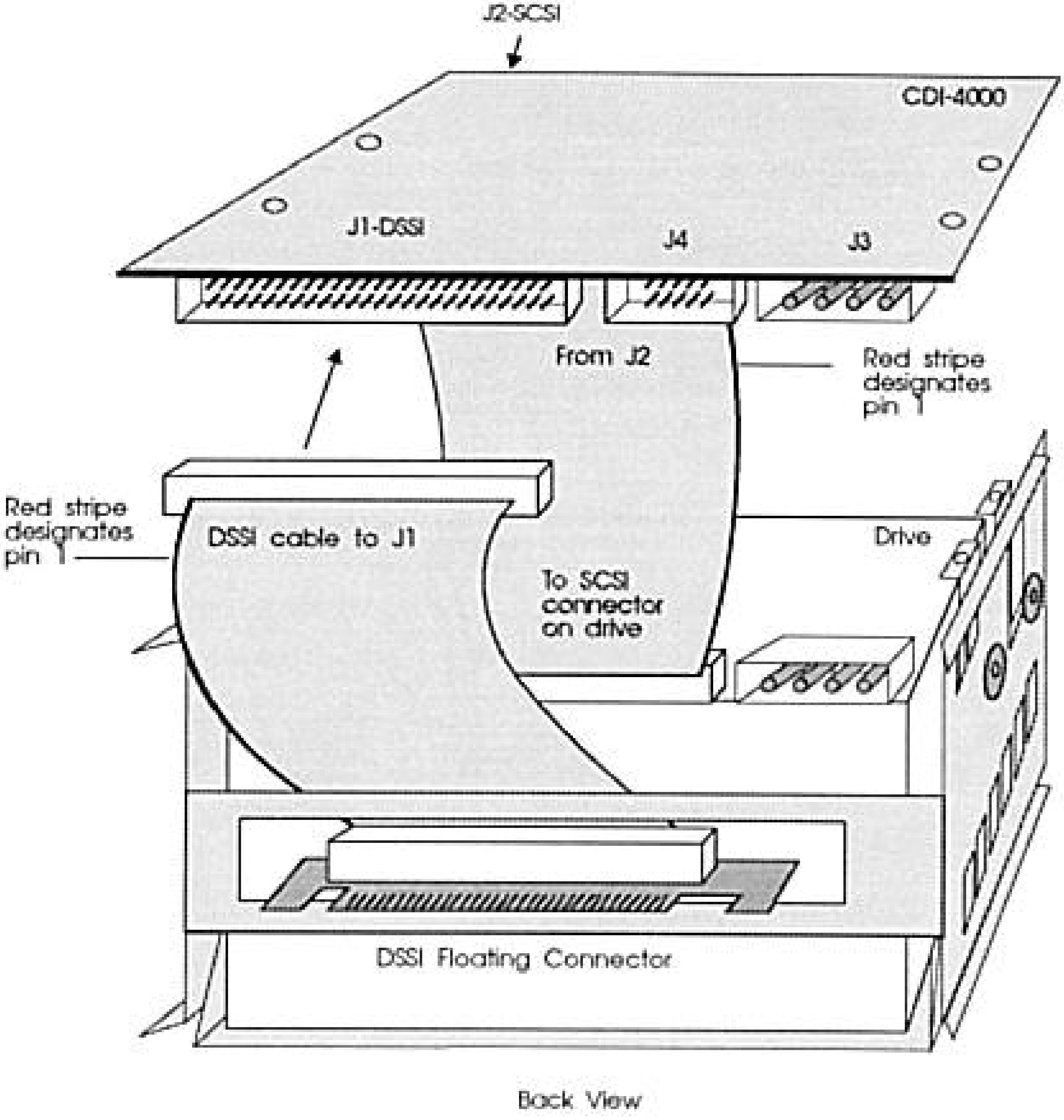

Figure 4-4: CDI-4000-SAE DSSI cable connection

7 Locate the power connectors from the floating connector.

8 Connect the end of the power connector to the CDI-4000 at J3 and the middle power connector to the drive. See Figure 4-5.

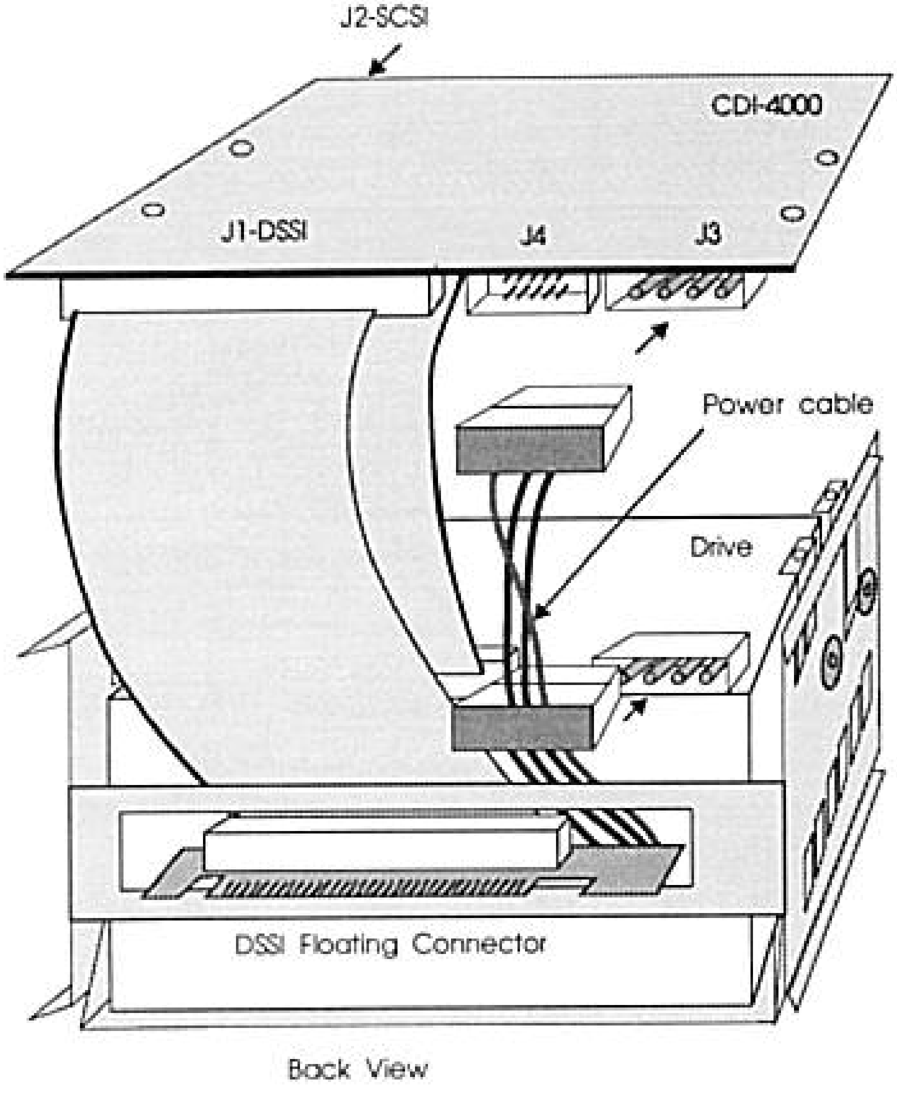

Figure 4-5: CDI-4000-SAE power connections

9 Place the CDI-4000 on top of the drive with J1 facing the floating connector (component side facing the drive).

10 Place the mylar insulator on top of the CDI-4000; see Figure 4-6.

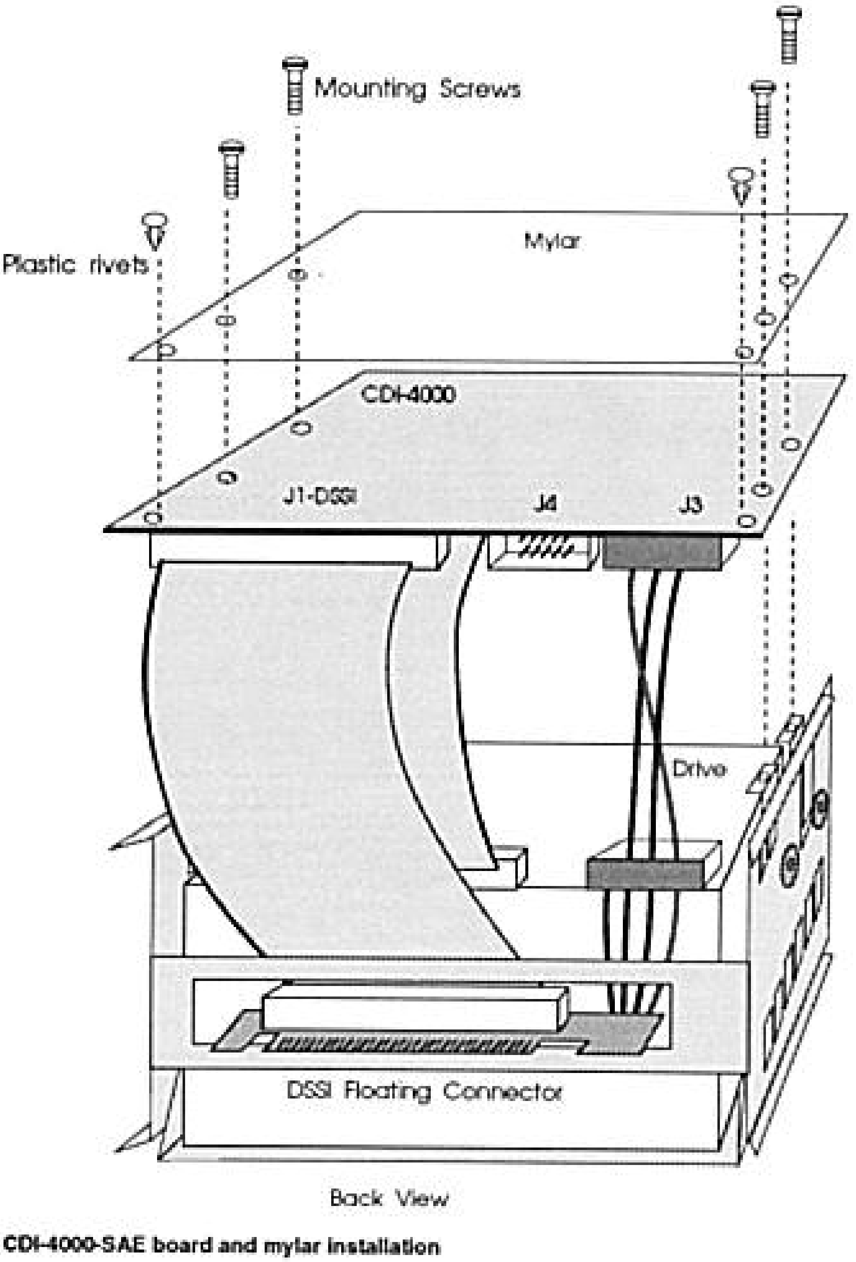

Figure 4-6: CDI-4000-SAE board and mylar installation

11 Put four screws into the ISE through the mylar insulator and the CDI-4000. Put two rivets into the CDI-4000 through the mylar; see Figure 4-6.

12 Turn the drive and the ISE chassis so that the mylar insulator faces the right and the floating connector faces the system. See Figure 4-7.

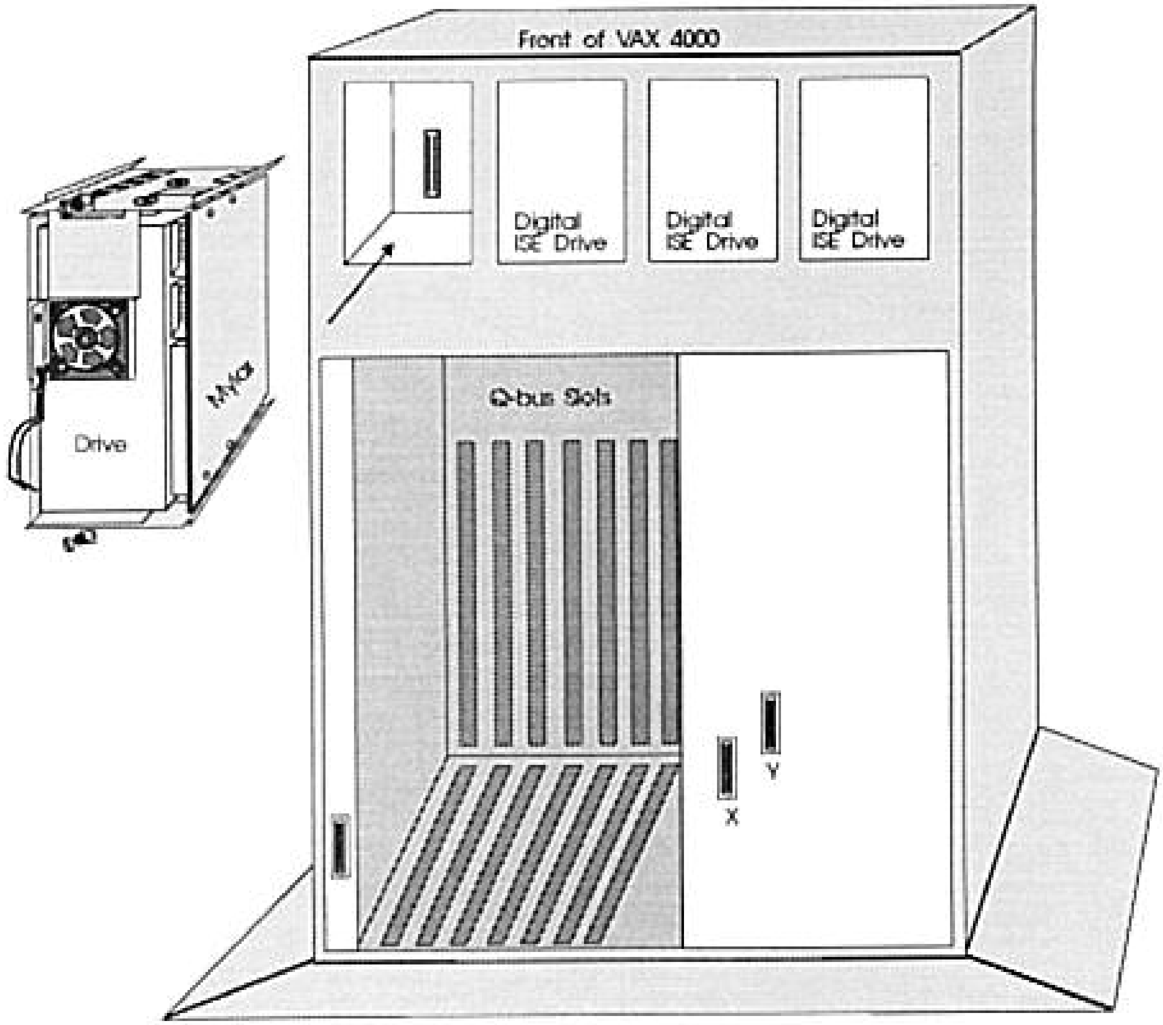

Figure 4-7: CDI-4000-SAE ISE and drive alignment

13 Align the ISE rails with the rail slots in the system and slide the ISE with the drive into the system until the floating connector is tighly in the DSSI connector in the backplane of the system. See Figure 4-8.

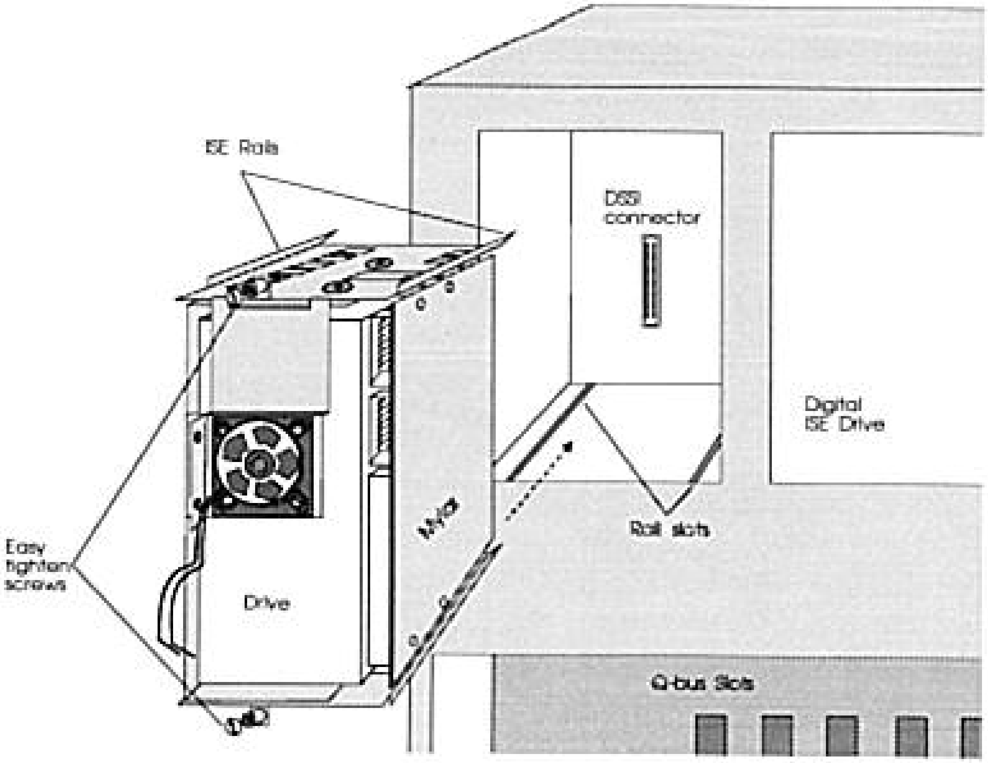

Figure 4-8: CDI-4000-SAE ISE and drive installation

14 Tighten the easy tighten screws now located on the top and bottom of the ISE chassis.

15 Connect one end of the 14-pin cable to J6 of the CDI-4000 and the other end into the back of the ISE front panel display. See Figure 4-9.

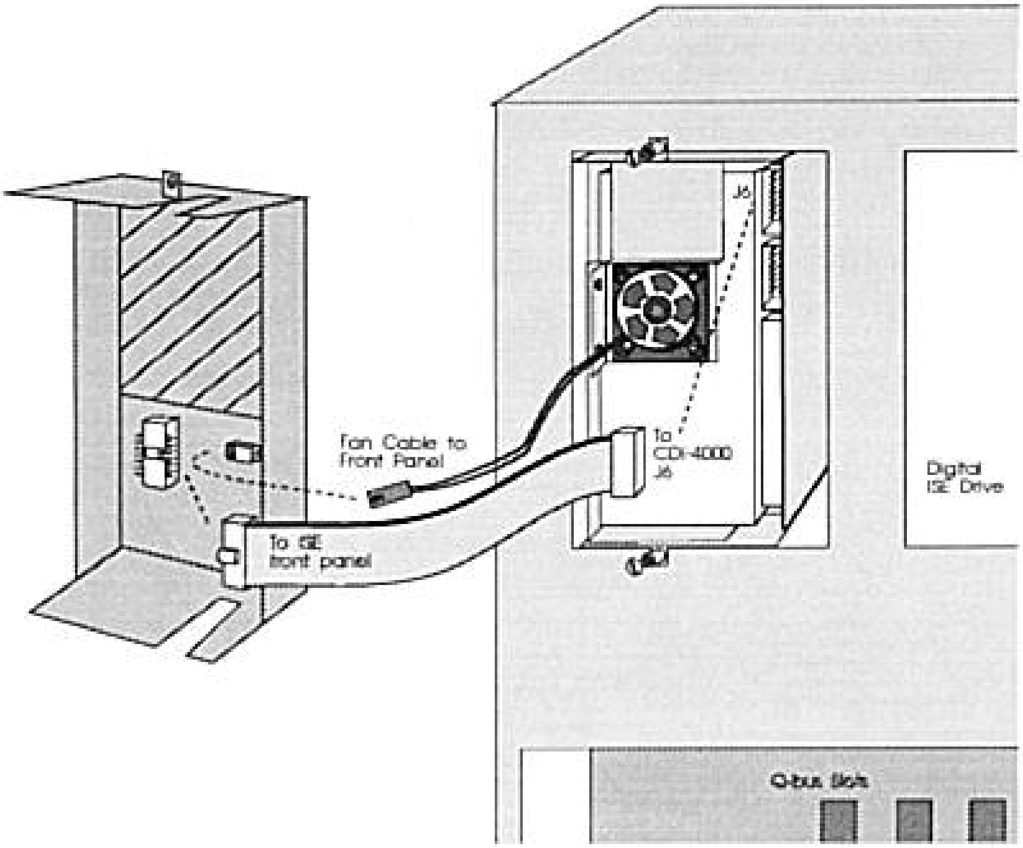

Figure 4-9: CDI-4000-SAE front panel connections

16 Connect the fan wire to the back of the ISE front panel display. See Figure 4-9.

17 Slide the two tabs at the bottom of the ISE front panel display inside the system chassis and slide the top tab into the system; see Figure 4-10.

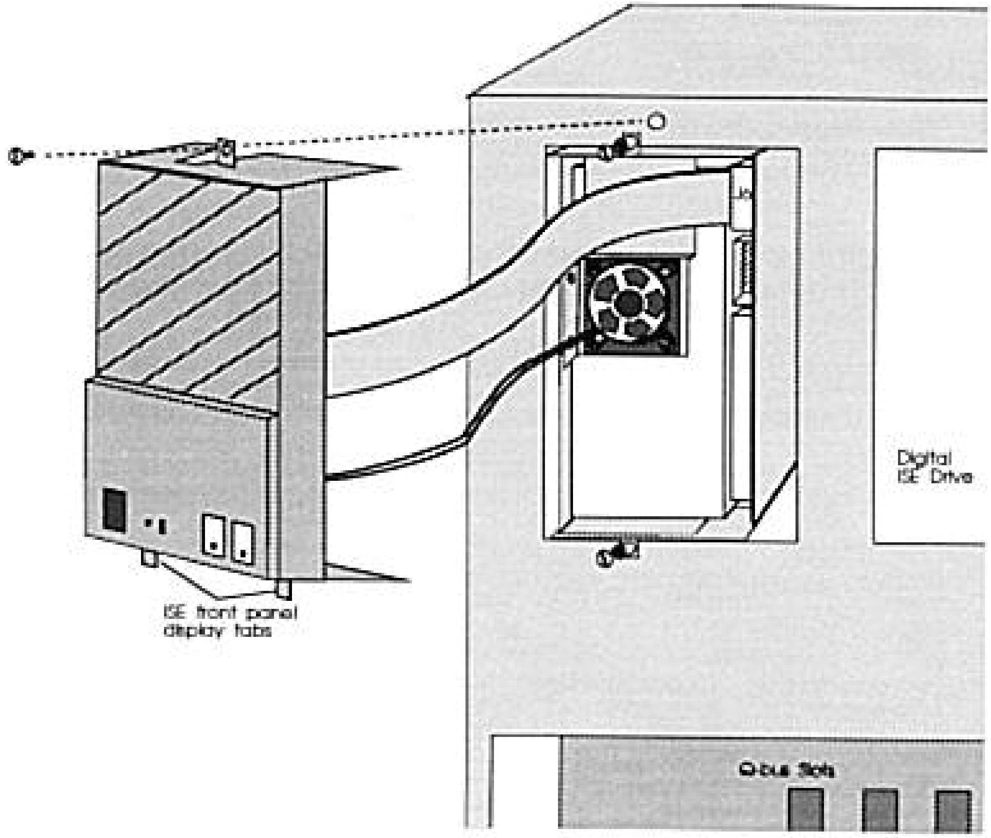

Figure 4-10: CDI-4000-SAE front panel installation

18 Put one screw into the system chassis through the top hole in ISE front panel display; see Figure 4-10.

CDI-4000-SA1 and Universal Drive Installation into VAX 4000

If you have the CDI-4000-SA1, any drive *other than* Seagate Elite-I or Elite-II disk drive (see Appendix A for drive list), and a VAX 4000, follow these instructions.

1 Carefully unpack the drive from its frame and remove the four screws (two located on each side of the drive) if applicable.

WARNING **Be sure to wear anti-static wrist straps or equivalent to protect the drive and the CDI-4000 from electrostatic damage.**

2 Put four screws into the drive through the ISE chassis, two screws on the right and two on the left side of the drive. SCSI connector on the drive must face the floating connector on the ISE chassis. See Figure 4-11.

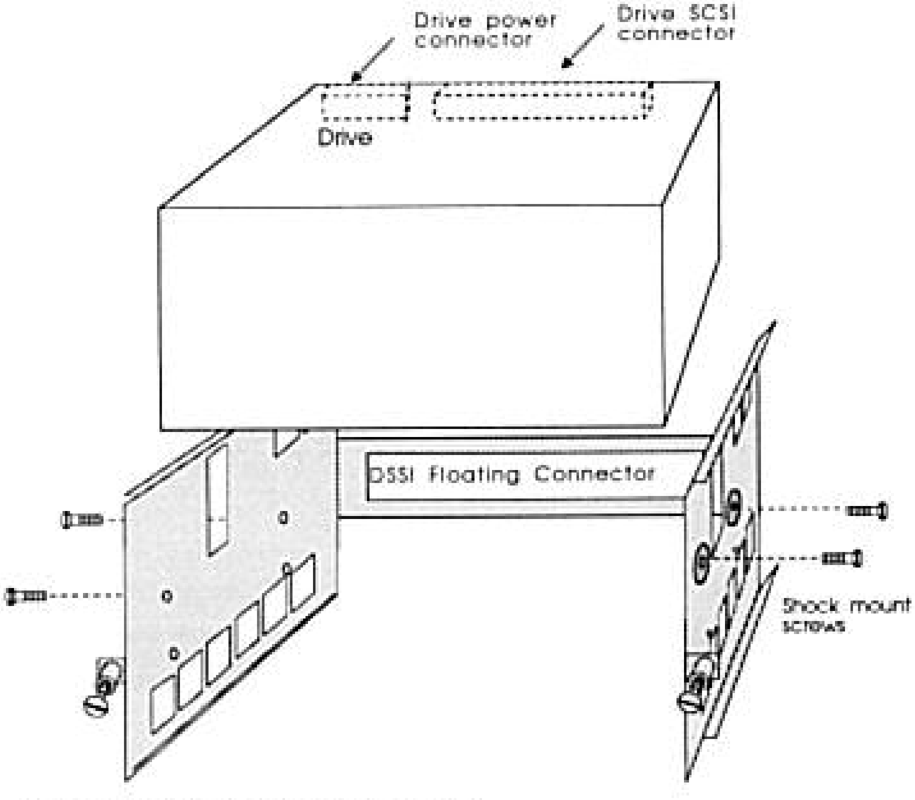

Figure 4-11: CDI-4000-SA1 drive installation

2 Connect tied up side of the SCSI cable to J2 of the CDI-4000 and the other end to the SCSI connector on the back of the drive (component side of CDI-4000 must face drive). See Figure 4-12 and 4-13. The flat portion of the SCSI cable will be laid between the CDI-4000 and the drive.

WARNING **To prevent damage to the CDI-4000, pin 1 of the SCSI cable and pin 1 of J2 of the CDI-4000 *must* align.**

NOTE Fold the extra cable toward the front of the drive.

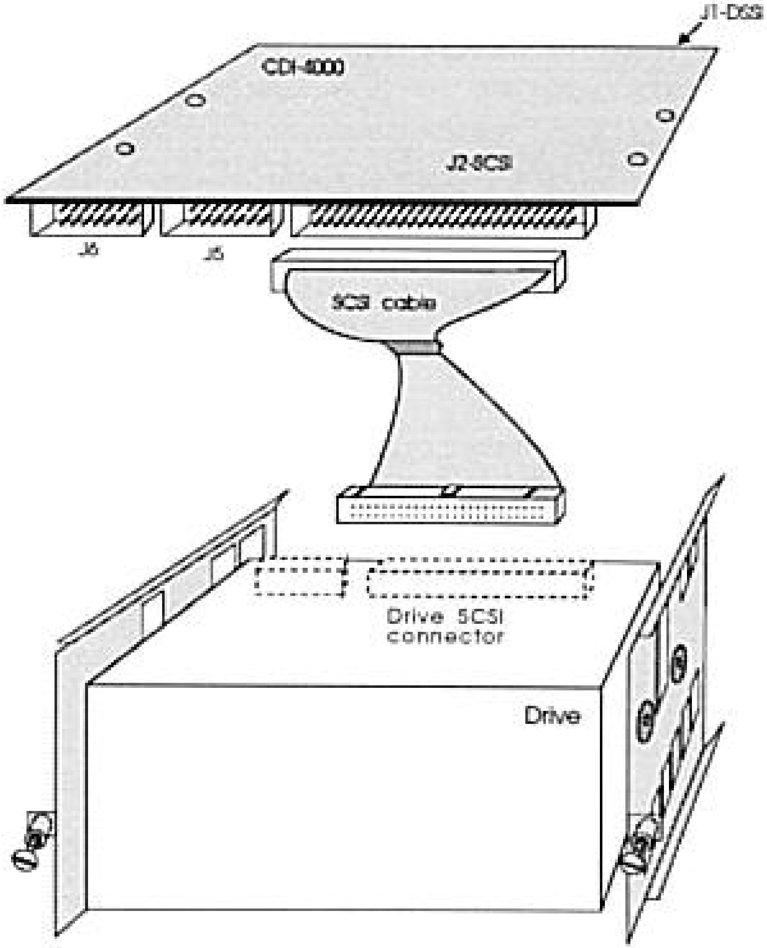

Figure 4-12: CDI-4000-SA1 SCSI cable connections

3 Connect the DSSI cable (50-pin cable, 2-inch long) from the floating connector to J1 of the CDI-4000. See Figure 4-13.

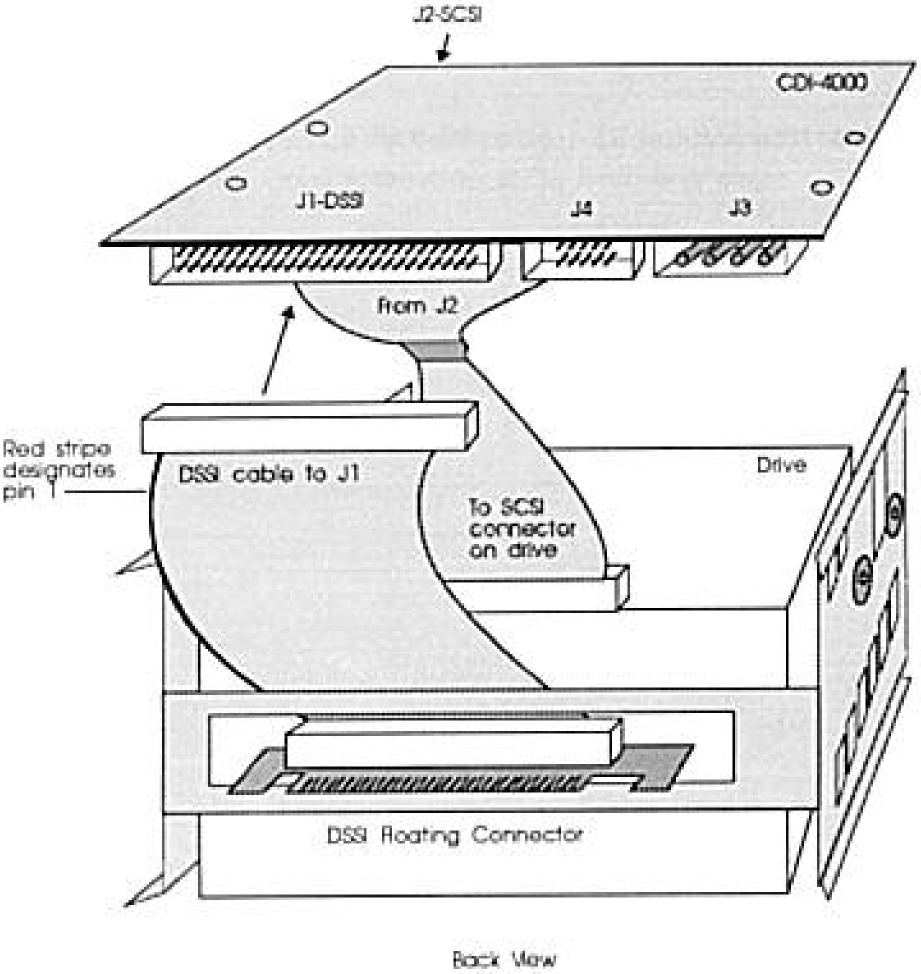

Figure 4-13: CDI-4000-SA1 DSSI and SCSI cabling

4 Locate the power connectors from the floating connector.

5 Connect the middle connector of the power cable to the power connector on the drive and the end connector to the J3 on the CDI-4000. See Figure 4-14.

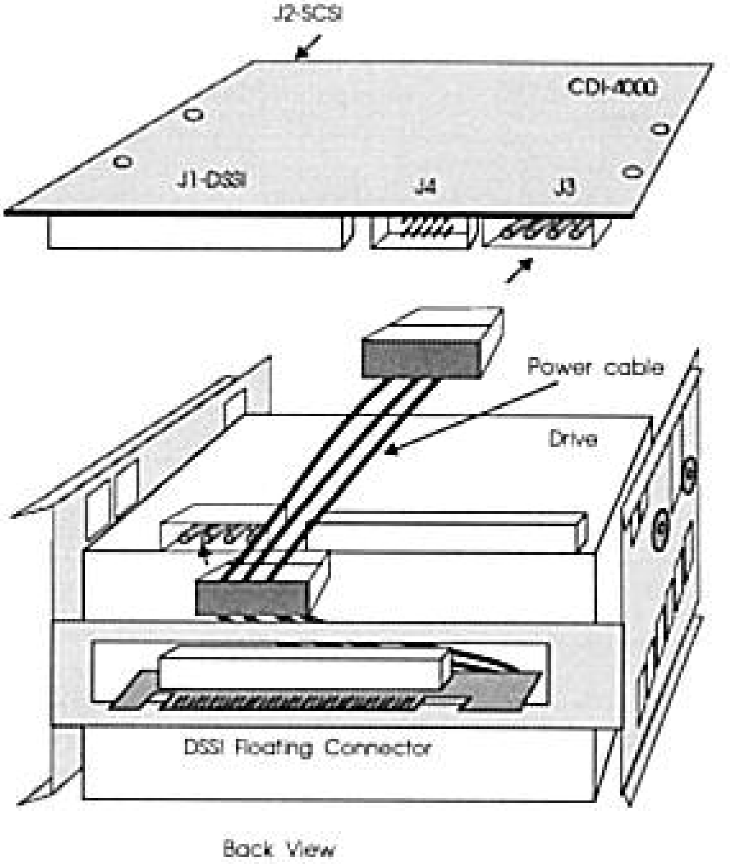

Figure 4-14: CDI-4000-SA1 power connections

6 Place the mylar insulator on top of the CDI-4000; put two rivets into the CDI-4000 through the mylar; see Figure 4-15.

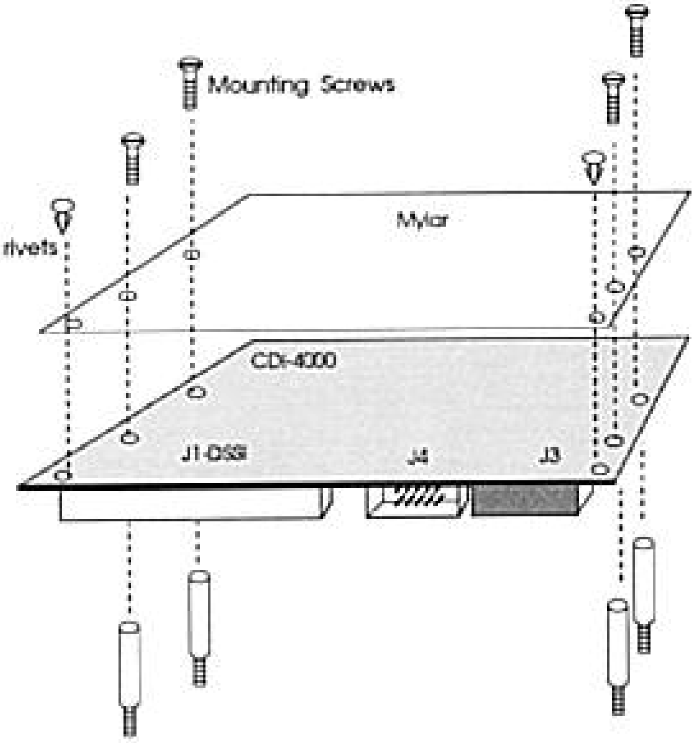

Figure 4-15: Mounting mylar and standoffs, CDI-4000-SA1

7 Put the four screws into the four threaded standoffs through the mylar and the CDI-4000. See Figure 4-15.

8 Place the CDI-4000 and mylar on top of the drive with J1 facing the floating connector, and component side facing the drive, and tighten four screws. See Figure 4-16.

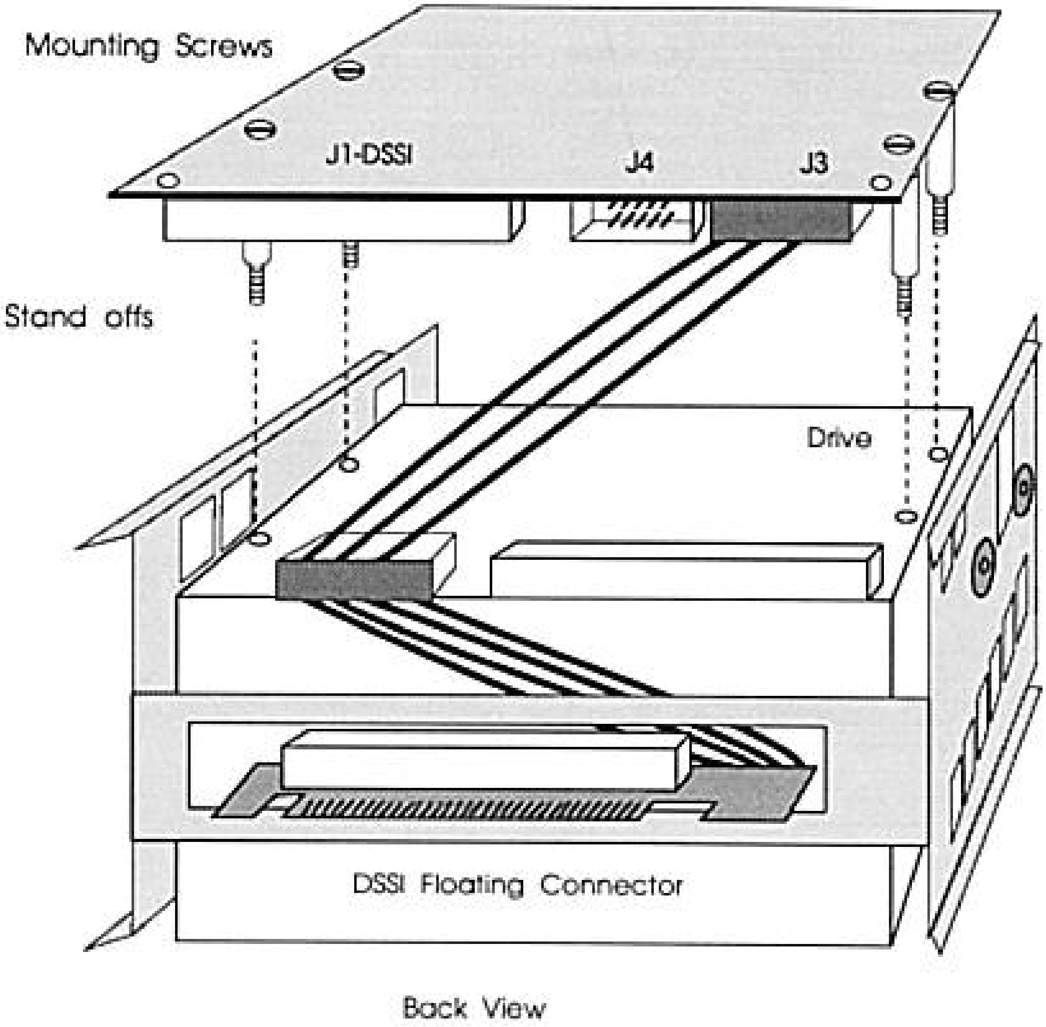

Figure 4-16: CDI-4000-SA1 board mounting

9 Turn the drive and the ISE chassis so that the mylar insulator faces the right and the floating connector faces the system. See Figure 4-17.

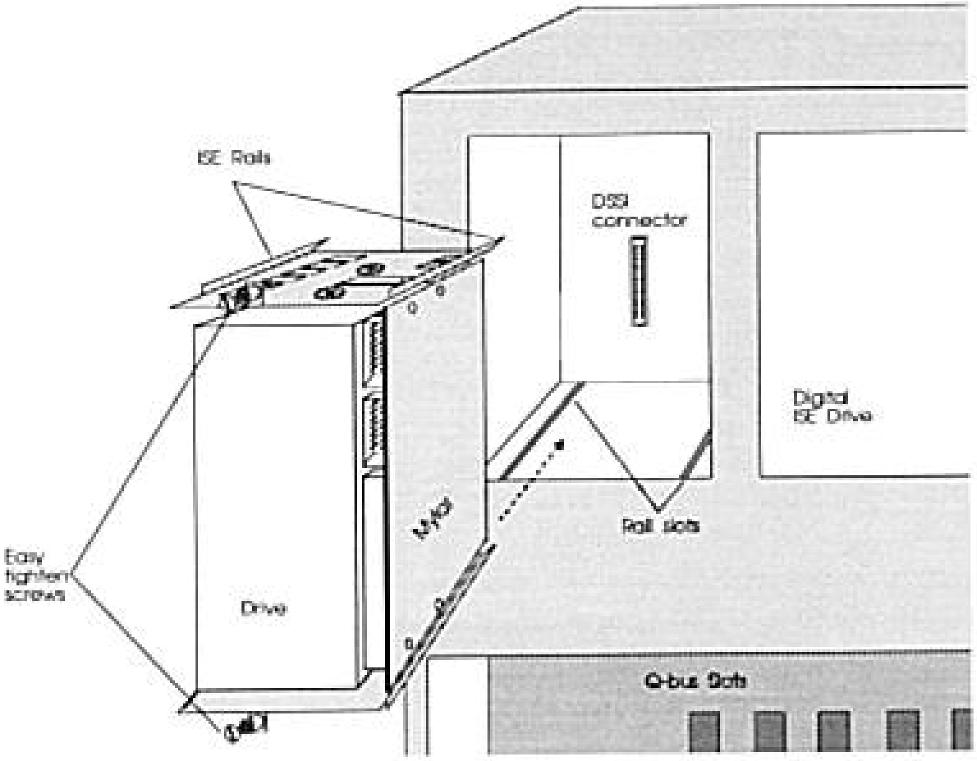

Figure 4-17: CDI-4000-SA1 ISE and drive installation

10 Align the ISE rails with the rail slots in the system and slide the ISE with the drive into the system until the floating connector is tighly in the DSSI connector in the backplane of the system. See Figure 4-17.

11 Tighten the easy tighten screws now located on the top and bottom of the ISE chassis.

12 Connect one end of the 14-pin cable to J6 of the CDI-4000 and the other end into the back of the ISE front panel display as shown in Figure 4-18.

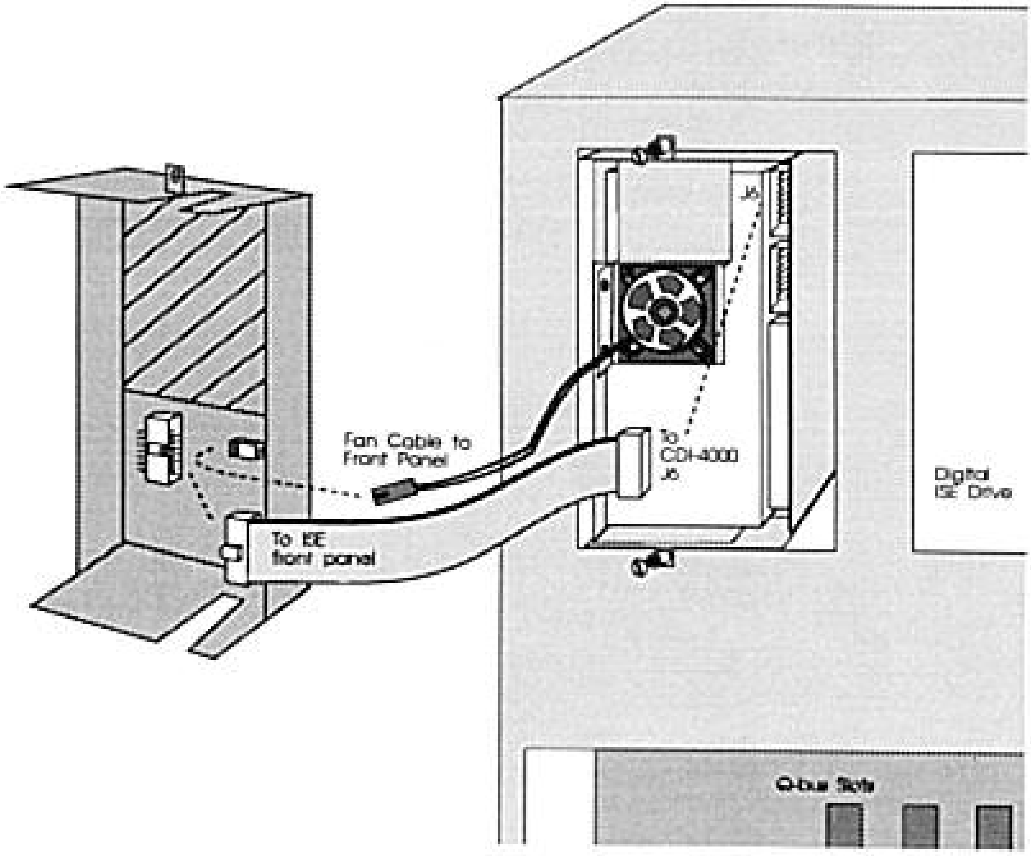

Figure 4-18: CDI-4000-SA1 front panel connections

13 Slide the two tabs at the bottom of the ISE front panel display inside the system chassis and slide the top into the system; see Figure 4-19.

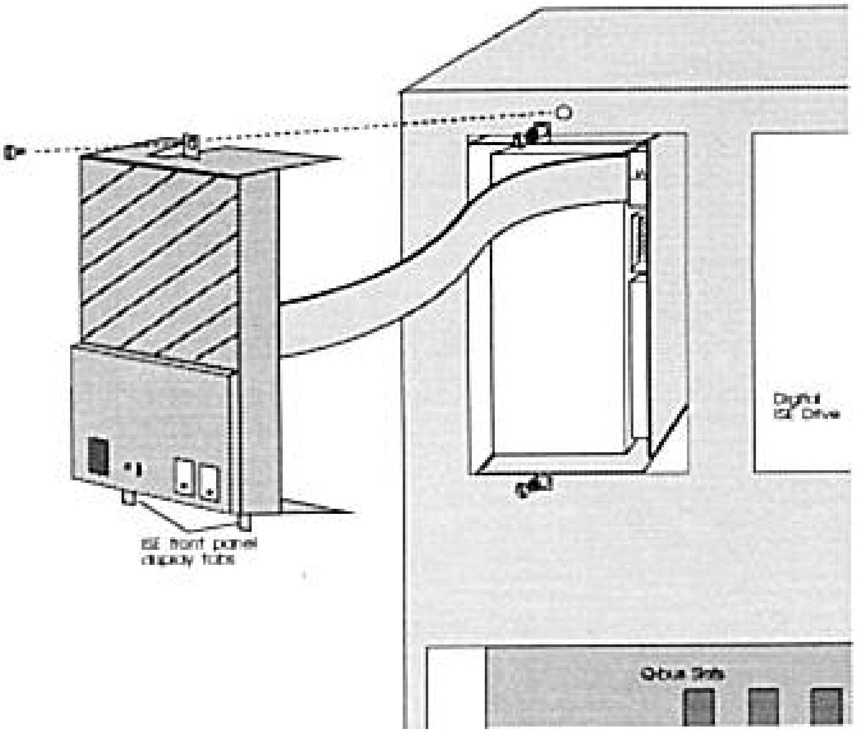

Figure 4-19: CDI-4000-SA1 ISE front panel installation

14 Put one screw into the system chassis through the top hole in the ISE front panel display; see Figure 4-19.

Installing CDI-4000-SA2 and 3 1/2-inch Drives into VAX 4000

If you have the CDI-4000-SA2, two 3½-inch disk drives, and a VAX 4000, install the ISE, CDI-4000, and the drives by following these instructions.

1 Carefully unpack the drives from their frame and remove the mounting screws (located on the sides and/or bottom of the drive) if applicable.

WARNING **Be sure to wear anti-static wrist straps or equivalent to protect the drive and the CDI-4000 from electrostatic damage.**

2 Place the 3½-inch drive into the disk holding tray and secure it by putting four screws into the drive through the bottom of the disk holding tray. Repeat for the second drive. (Drives' connectors must face left when viewing from the rear.) See Figure 4-20.

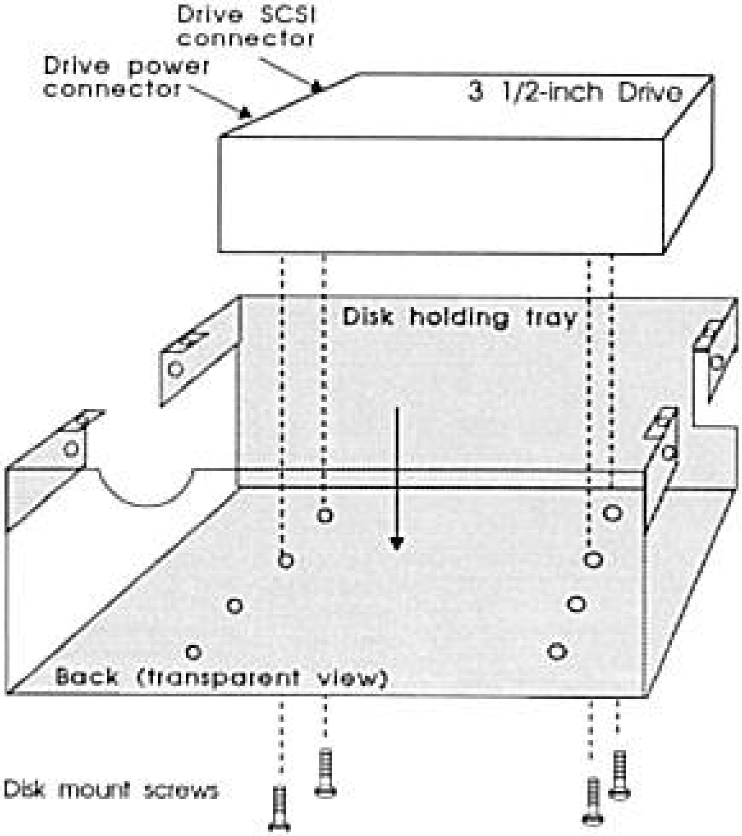

Figure 4-20: CDI-4000-SA2 drive installation

3 Put the mylar on the solder side of the CDI-4000 and put two plastic rivets into the CDI-4000 through the mylar. See Figure 4-21.

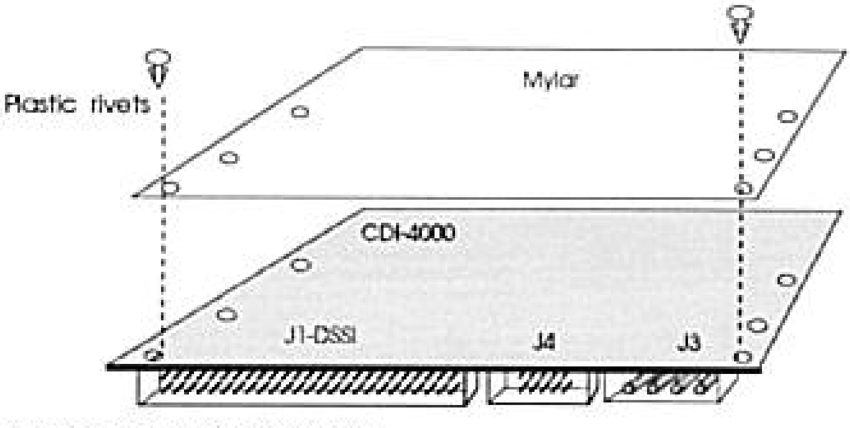

Figure 4-21: Mounting mylar for CDI-4000-SA2

4 Locate the power cable (with four connectors) and follow these instructions:

a Connect the connector labeled 1 or A to the first drive.

NOTE Use connectors labeled A or D for drives that have the power connectors on the sides of the drives standing up.

b Connect the connector labeled 2 or D to the second drive.

c Connect the connector labeled B to J3 on the CDI-4000

d Connect the connector labeled C to the power connector on the back top of the floating connector holder, see Figure 4-22.

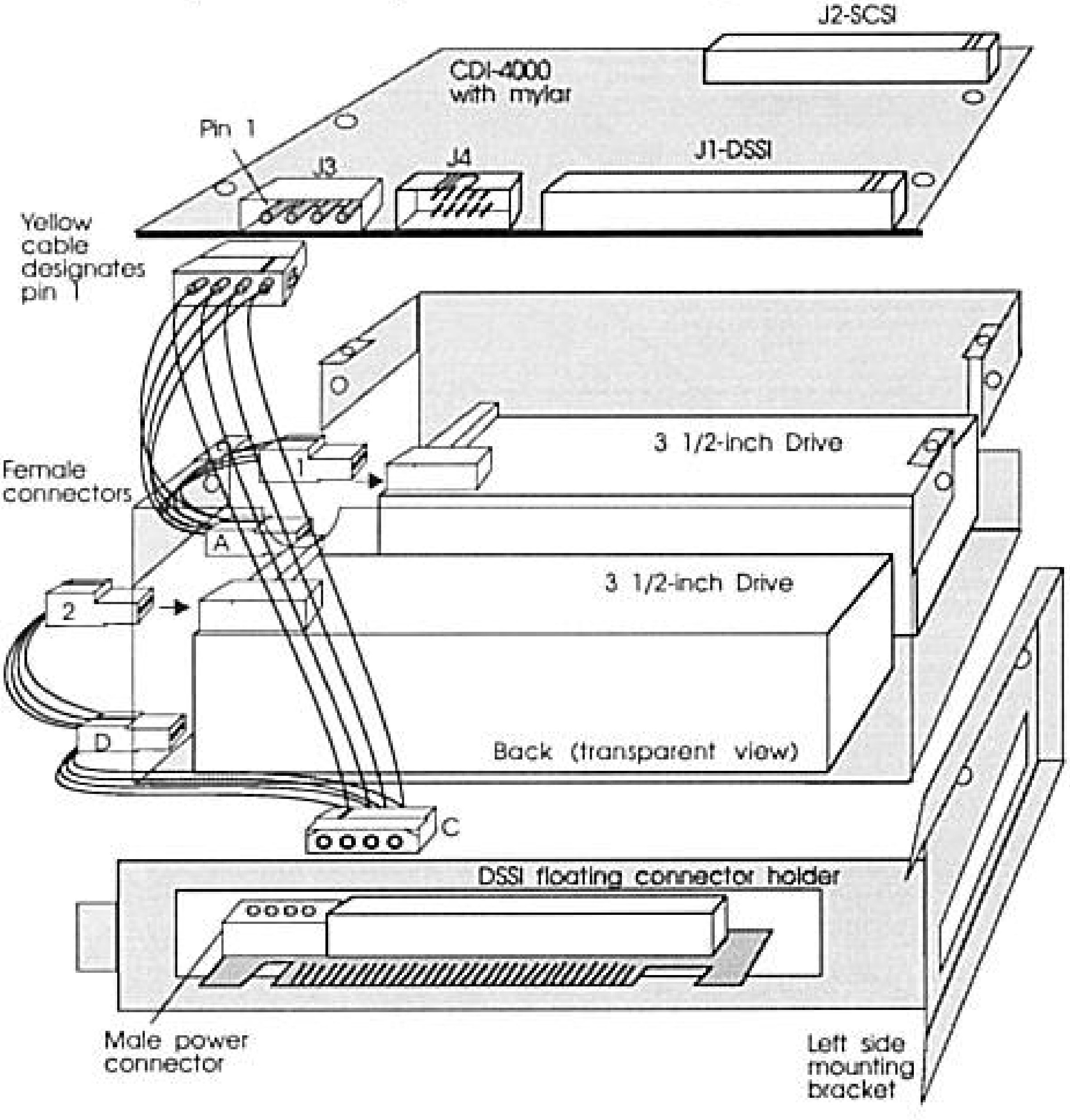

Figure 4-22: CDI-4000-SA2 power connection

5 Locate the SCSI cable; connect the middle connector of the SCSI cable to J2 on the CDI-4000, and connect the two ends of the SCSI cable to the drives' SCSI connectors. See Figure 4-23.

WARNING **To prevent damage to the CDI-4000, pin 1 of the SCSI cable and pin 1 of J2 of the CDI-4000 *must* align.**

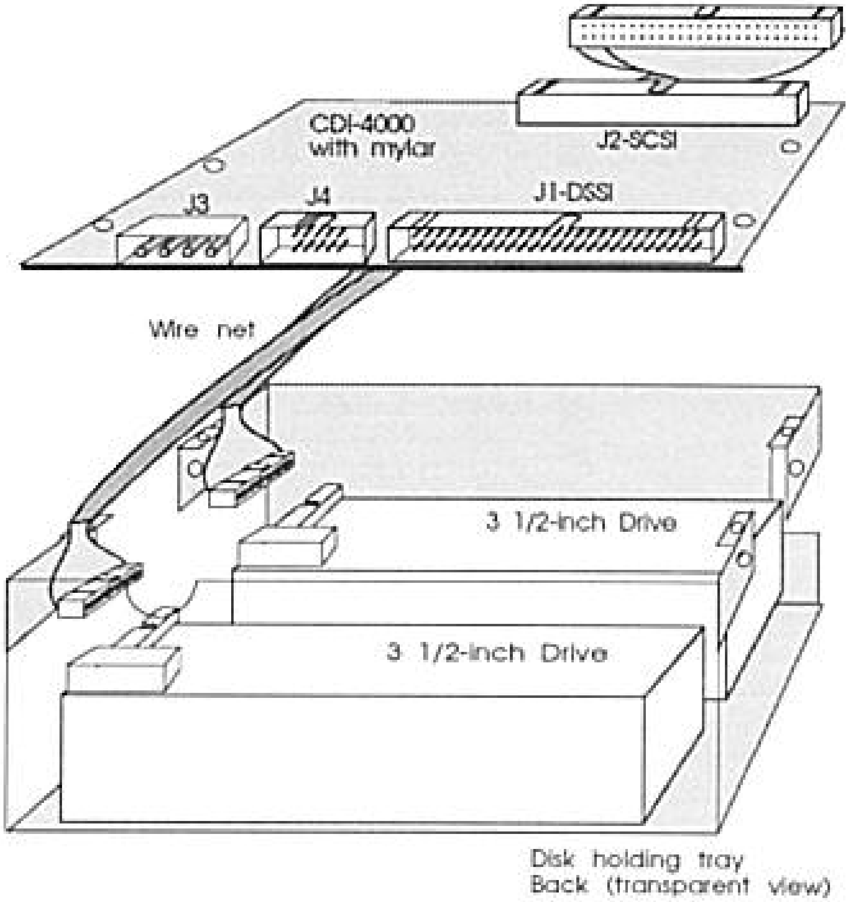

Figure 4-23: CDI-4000-SA2 SCSI cable connections

6 Terminate each end of the SCSI bus by removing terminators on the CDI-4000 and by making sure the terminators are in place on the drives (see Chapter 3, "Hardware Configuration").

7 Locate the DSSI cable; connect one end to the DSSI connector, J1, on the CDI-4000; connect the other end to the DSSI connector on the back of the floating connector holder. See Figure 4-24.

WARNING **To prevent damage to the CDI-4000, pin 1 of the DSSI cable and pin 1 of J1 of the CDI-4000 *must* align.**

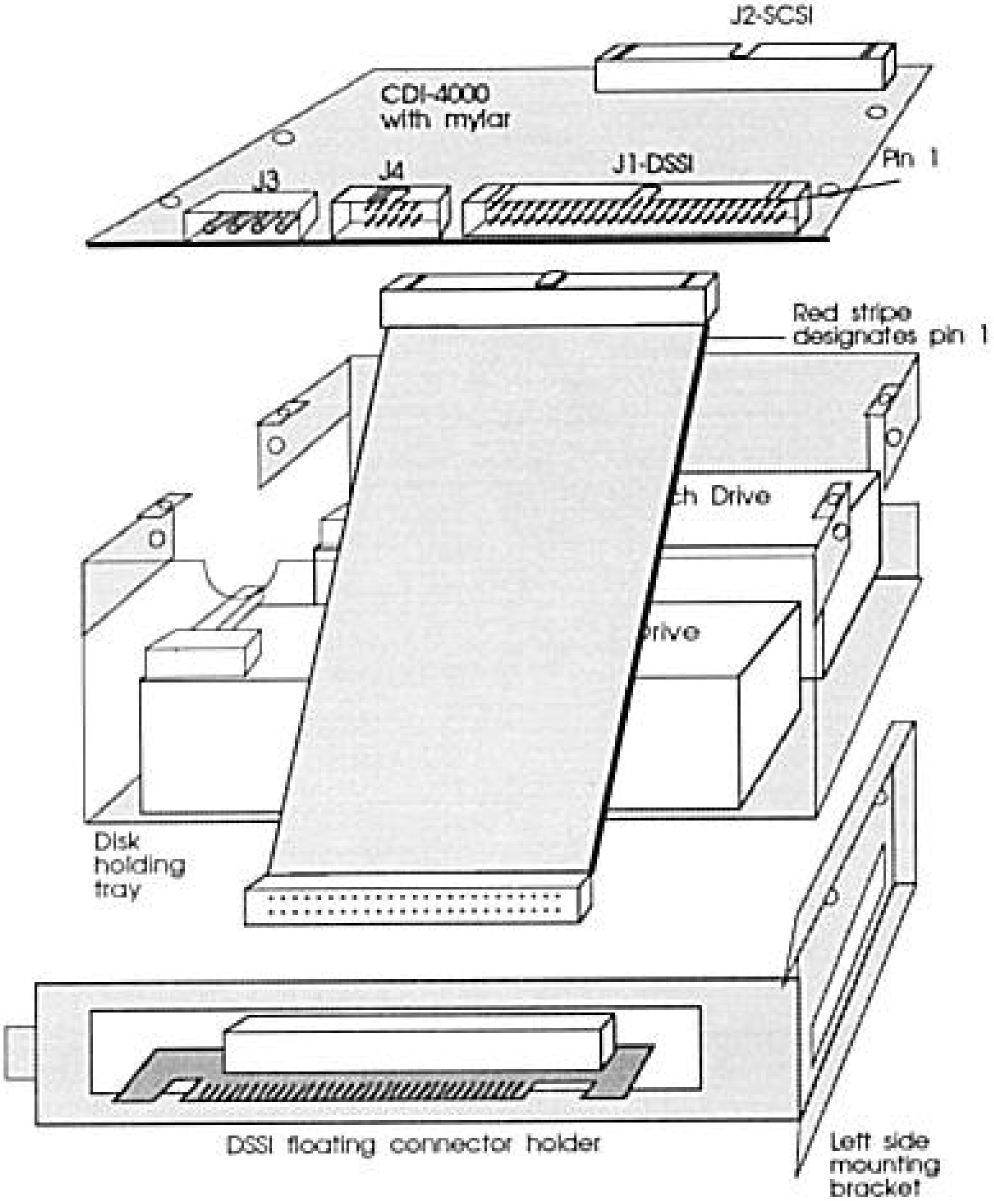

Figure 4-24: CDI-4000-SA2 DSSI cable connections

8 Terminate each end of the DSSI bus; see Chapter 3, "Hardware Configuration."